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SCHOOL AND SOCIETY

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WITH THE COOPERATION OF W. CARSON RYAN, JR., AND RAYMOND WALTERS

Volume XX | SATURDAY, DECEMBER 13, 1924 | Number 520

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THE SCIENCE PRESS

LANCASTER, PA. GARRISON, N. Y.

GRAND CENTRAL TERMINAL, NEW YORK CITY

Entered as second-class matter August 15, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

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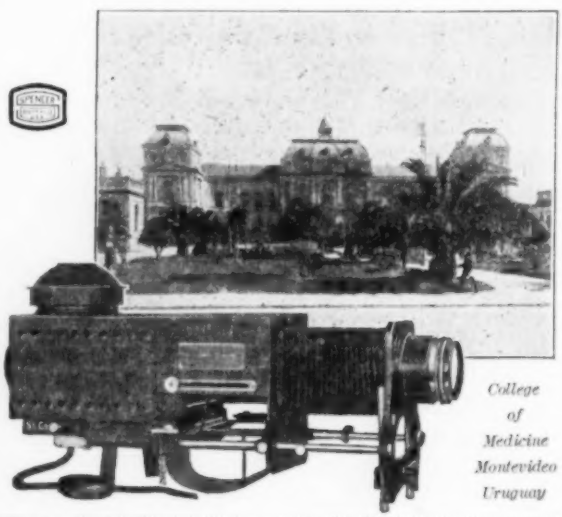

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CHEMICAL LABORATORY STUDY

IN the early laboratory courses, which included shopwork, woodturning, etc., the most emphasized purpose seems to have been the development of craftsmanship; in fact, in many cases the graduate of certain courses was an artisan, subjected in the course of his apprenticeship to certain courses of lectures but trained primarily in the manipulation of specialized apparatus, such as that of the chemist. He was skilled at pulling apart a restricted group of the materials of nature and commerce and at determining the ratios in which the simpler substances were united. He could also reverse this process which, of course, is known as analysis, and put together some of the simpler materials and secure substances of greater complexity. The stage of development is not unlike this in some institutions at the present time. The earlier simple apparatus has given way to the quite complicated tools evolved by modern science, but the experimenting on them seems to be largely a matter of working with or on them as a matter of observing the tools which stand for the present development of the science, especially in a practical way.

It seems as though the student is required to perform an experiment on each instrument simply to familiarize him with this tool because it may be useful in his activities after leaving college. The experience of having performed certain tests as prescribed by standard practice is seemingly regarded as necessary; for example, it is considered essential by some for mechanical engineering students to operate a calorimeter and an Orsat gas analysis outfit, to know intimately, for example, the regulations for manipulation set down by the American Society for Testing Materials. Similarly, it is thought by some that civil engineering students must have made a few tests with a penetrometer or viscosimeter, and chemical engineering students are not properly trained unless they have used a saccharimeter and a Beckmann thermometer. Now no quarrel with these instruments is intended; the full harmony of mind and body necessary to carry out precise measurements can not be gained by thought alone. Practice in careful manipulation is an essential but need not be done for itself alone and certainly not to the exclusion of everything else, as is sometimes the case. Many of the instruments commonly handed over to the student for an afternoon's inspection should properly be used in a course of larger vision, but the habit of performing an experiment on such instruments, *per se*, simply to familiarize the student with their calibration and operation soon brings us to the intellectual level of the trade school.

The use of such tools can profitably be made incidental to some larger purpose; thus the Beckmann thermometer may be used, for example, in the determination of molecular weights of a certain limited class of substances by the freezing or boiling point methods. In this process data are secured concerning percentage ionization, molecular aggregation and other factors of far-reaching importance to the young student of science. Use of a tool in this way will of course familiarize the student with the tool and it will also show him how scientific facts and principles are derived by the use of the tool.

In the less advanced courses of general chemistry, including what is commonly known as qualitative analysis, it is felt that the primary purpose is to have the student proceed in his thought along the broader and more general purely scientific principles rather than to sort out for him a

certain class of facts which may be expected to have a direct bearing on the line of work the student thinks he is going to follow when he takes the course. Now the majority of freshman college students have had some previous course in chemistry. While the training in some high schools leaves nothing to be desired, it must be admitted that in many high schools the training is inclined to be spectacular and superficial. The so-called theoretical side of it has often consisted mostly in memorizing the facts presented, with the result that the student has a strong dislike for this feature of the subject. He has found the memorizing of the rather peculiar names, formulas and equations a fretful job. He hopes that the college course will not expand along the same lines and rather trusts that he will observe more spectacular experiments, together with the uses and applications of these things insofar as he might have occasion to meet them. To some extent we are willing to meet his hopes. The broad general application of his chemistry studies to scientific habits and the affairs of life is both interesting and instructive to him, although a study of the various uses of the materials one by one will prove burdensome rather than inspiring.

Disappointment on one score is, however, at hand—the A B C's of chemistry have to be learned all over again from a different point of view; chemical formulas, names and equations were not meant to be memorized. They are derived from a relatively small number of laboratory observations by the use of comprehensive scientific principles. The student, however, does not want to derive them. He wishes to continue in the same path as heretofore, learning the statement of any laws or principles which his teacher brings forward and absorbing such facts as he can, but facts and principles are kept separate. To this, however, we object in principle and practice. The knife of physical chemistry has very largely eliminated the drudgery and memory work of the old-fashioned course in descriptive chemistry for college teaching; for example, it would be considered unwise to learn the density of the gaseous substances one by one; unwise to carry in mind a recipe of proportions of the materials used to make some product. These can be calculated at convenience from simple physico-chemical principles. If the method of thus removing the drudgery can be carried to the high school, it seems sure that many students will be attracted to scientific careers who are now repelled by the burden of work in old-fashioned science courses, particularly that of chemistry.

Again, let me take a concrete example to illustrate the point that too much emphasis is laid on memory work with the result that scientific thought and curiosity, which can be developed most easily by means of chemistry, are not properly stimulated. There is a family of elements, known as the halogens, which are very similar but which show a regular gradation in all properties from each member to the succeeding one. The elements in the group are F, Cl, Br, I. A study of these elements is justified in all courses by industrial importance of some of their compounds—thus, $KClO_3$ is universally used in matches, $Ca(ClO)_2$ for bleaching, HF for etching glass, NaCl for table salt, etc.

These applications do, of course, receive recognition in passing in our own classes, but the family as a whole receives much more attention than would be justified by these utilities. We regard this family as one of the most valuable groups of elements from a teaching point of view, in starting the student to think scientifically. Starting from a few facts (possibly five) which can readily be gleaned from simple laboratory experience, the student can acquire a very striking idea of the relation of compounds to one another. He can start from a specific reaction and go on to other similar reactions; in fact, he can learn to go from

a complicated reaction to the simple fundamental one. The memorizing process so common to his early efforts gets a serious jolt at this point. Thus, to consider an example, the student prepares chlorine in the laboratory by heating a mixture of MnO_2, H_2SO_4 and NaCl. The equation as he often memorizes it is as follows:

$$2H_2SO_4 + 2NaCl + MnO_2 = Na_2SO_4 + MnSO_4 + 2H_2O + Cl_2$$

The same action expressed as a series of steps leading to the formation of chlorine is indicated as follows:

$$H_2SO_4 + 2NaCl \rightleftarrows 2HCl + Na_2SO_4$$
$$MnO_2 \rightarrow MnO + O$$
$$O + 2HCl = H_2O + Cl_2$$
$$MnO + H_2SO_4 = MnSO_4 + H_2O$$

$$2H_2SO_4 + 2NaCl + MnO_2 = Na_2SO_4 + MnSO_4 + 2H_2O + Cl_2$$

The individual steps are simple and logical to the student, and therefore the equation written in steps becomes easier. How about the principles involved? Apparently as indicated the necessary features consist in (1) the liberation of the free hydrohalogen acid by a less volatile acid, and (2) the oxidation of this hydrogen compound forming water, the liberation of the halogen being really incidental. If this is true, then another non-volatile acid could be substituted for the H_2SO_4, another oxidizing agent for the MnO_2, and finally a different salt of one of the other halogens for the NaCl. Thus, if our reasoning is correct, as apparently dissimilar a mixture as $H_3PO_4 + AlBr_3 + KMnO_4$ should nevertheless liberate the free halogen, bromine in this case. The student tries this combination in the laboratory and tries a few other combinations like it, and finds by these trials that this reasoning on broad scientific principles is justified by the experimental results. After this he can anticipate that any other similar combination, for example, $K_2Cr_2O_7 + H_2SO_4 + AlI_3$, will liberate the free halogen. Further and beyond this, he learns that the real basis of the liberation of the halogen is the union of hydrogen and oxygen to form water, that is, he goes from a more complicated practical experiment to a simple general principle.

A thoroughgoing study of beautiful scientific points like this one requires much more time than would be allotted to them in an old-fashioned descriptive course which covered the elements one after another, taking up the so-called important points. Such a laboratory course naturally omits many so-called practical points—thus, in the laboratory we make one oxide of nitrogen out of the five; similarly, CO_2 is carefully prepared and studied but the industrially important CO is not prepared. The time-honored experiments of analyzing a dime, making blueprints or soap, or dyeing are not even considered.

The fullest possible use of the laboratory observations is governed by the same principles. The old-fashioned method consisted in writing up the results in composition style with suitable drawings, statement of materials used, object of the experiment, etc.—a time-consuming operation attended with indifferent results. In many modern courses the observations are recorded simply as answers to a series of questions. These questions are carefully wrought out and are designed to build up a definite idea on the involved point, starting from the laboratory observation. The questions are numerous and searching but do not go far afield. The answers are often set down on blank pages in the book just opposite the descriptive matter on the subject under investigation.

The work of the second term is often partially given over to what is commonly called qualitative analysis. Students mature faster by means of a coherent course involving thought in developing a continuous chain of logical events designed to separate the elements, than by a continu-

ation of the same kind of work as done in the first term. The science is opening out before the student; he begins to use his wings. The course is, however, not designed to be especially practical and to turn out a capable analyst. The separation and detection of the elements is based on similarities and dissimilarities of the compounds of the elements. These facts and the relations underlying them are administered rather painlessly in the course of analysis because of the rather receptive attitude of the student towards things which he regards (often erroneously) as useful. The chemical principles brought out by the separation of the elements can best be seen if complications are absent, except so far as may be advisable from other considerations. For this reason tests for molybdenum, tungsten and other elements of commercial importance are often not considered. On the other hand, a great deal of attention is given to the great modern principles of mass action and solubility product, which includes, of course, a study of electrolysis and electrolytes, molecular aggregation, effects of dissolved substances on the freezing points, boiling points and osmotic pressure and so on. A great deal of time is spent in mass action calculations aimed to demonstrate why a certain quantity, say 2.5 cc, of hydrochloric acid is used at a certain place. This brings us to another point worthy of attention in laboratory courses, namely, the matter of what is often referred to as "cook bookery." As contrasted with the conditions of a few years ago, it is now possible by means of the modern principles of mass action, ionization, etc., to calculate the concentration of an ion needed for the fractional separation of sulphides, carbonates and other salts. The student may therefore be required to calculate the quantities of reagents needed for a few important steps in the operation. Even though the student is required to build up the scheme of analysis to a partial extent from the simple fundamentals, some data on proper quantities, 5 cc, 8 cc, etc., must nevertheless be given to him because of the excessive amount of time needed to make calculations of all quantities used during say a qualitative analysis. It would appear that this procedure of having him derive the more important quantities and then giving him the others with proper reservation would prevent him from getting into the habit of proceeding blindly according to a printed form of analysis. Experience has shown, however, that in the majority of actual cases too much reliance can not be placed on the student at this stage.

It is further demonstrated that even in the more advanced courses too much can not be assumed regarding proper mental attitude. For example, in the quantitative analysis laboratory the student learns to take apart natural and scientific materials. As a simple case he converts the insoluble copper compounds of a copper ore into the sulphate which he knows to be soluble, and can then, for example, deposit the copper completely on a platinum electrode as a beautiful sheet of copper which can be seen and weighed. Again, he finds that repeated trials show the proportion of Ag in AgCl to be always the same. With this principle established and in mind, he converts unseen silver compounds into insoluble AgCl, weighs this and by simple reckoning gets a number which represents the proportion of Ag in the ore.

There is a natural fascination in work of this kind. It is, moreover, common knowledge that the analysis of natural and scientific products is an occupation by which a young man may earn a living. The student, therefore, approaches the course with the feeling that it should proceed along technical applications of the subject only. He is impatient at any effort to bring out underlying scientific principles by comparison of many methods on the

same material. He wants to follow rapidly some standard method for the analysis of coal and limestone and steel and other useful materials so as to gain a feeling of wide experience, rather than to study the factors which affect a certain procedure and determine which is the more sound course of action or scheme (as he calls it) on a scientific basis and will therefore give better results. He is prone to "cook book" a scheme without disturbing himself too much about the whys and wherefores and without really knowing what is being accomplished at the various steps other than the last one.

The same tendency, possibly especially true of engineering students, is noticed in the work of building compounds to order in the organic laboratory. A certain compound is listed for preparation as a requirement of the course. Very well. Experience shows that the mind of the student functions something like this. What experiment is it? What apparatus is needed, and what chemicals? Where does he find the method of preparation? How long does this experiment take? As a result of these and other self-asked questions some apparatus is gathered together as indicated by the sketch on page so-and-so. Chemicals are introduced in the quantities prescribed and the burner put under as shown in the sketch. The product after suitable cooking, etc., is bottled and labeled and turned in as Preparation No. —, and as a final bit of satire, the university catalog states proudly that this substance is one of those prepared and studied in the laboratory.

Now the teacher hopes that points like the following will suggest themselves to the student's mind. What is the chemical relation of the product to the original materials? What is the nature of the process —is it substitution or oxidation, etc.? If oxidation, why was the particular oxidizing agent used? Why not some other one? Why was the readily available oxygen of the air not used? Is it because the oxidation would be slow with a limited surface exposed to oxidation by air? What was the rate of reaction? Why was this particular substance selected as one to be prepared? The teacher hopes for some such mature thinking.

The actual mental process will undoubtedly be a compromise between these in all cases, but if the laboratory course is run by so-called supervision (supervised rather than taught) there is not much doubt as to which process will predominate. One way to secure the desired habits of thought is to hold a quiz on the whys, wherefores and whats of a half dozen experiments before the student attempts any of the actual experimental work. After such a quiz the compounds are prepared in a much more intelligent manner. In some cases the teacher can require a short preliminary report on the principles and reactions involved before the student is permitted to start the laboratory work on that phase of the subject.

Of late years laboratory courses given under the names of industrial chemistry and chemical engineering have become quite popular and have been introduced into many curricula. Colleges have vied with one another in elaboration of machines for such laboratories. In many cases the size of the installations has been sufficient cause alone to defeat the object of the laboratory. The student thinks that the performance of a few previously assigned mechanical duties in the course of the so-called test has taught him the "dope" about the outfit. Actually very often as the size and complication increases the chance to learn the broad fundamentals involved in the work of the day becomes less and less. The student has undoubtedly profited by the experience of serving as one unit of a system, as a cog in a machine, but this in no way premises that he has gotten any real physical concept of the major scientific principles involved in the test. A recent trend to industrial chemistry laboratory practice which seems promising is the intro-

duction of the modern tools of physical chemistry as a means of studying the soundness of processes and principles used in industrial chemistry practice.

Underlying the several principles laid down and applying to all the courses mentioned, the most potent factor is the teaching. Modern laboratory courses in chemistry are to be taught, not supervised. It is common practice in the various laboratories of many universities to man the laboratory largely with graduate students in the guise of teachers. The professor in charge supervises the laboratory period from the seclusion of his office, and the students go along with the various prescribed experiments, while the graduate assistants wander about and answer any questions directed to them. Now, an experienced teacher does not expect the work in a chemical laboratory to proceed like the process of fabrication of a standard bolt or nut. The work of a five weeks' period will comprise a broad general study of a family of elements such as the sulphur family. Although several different substances may be studied, the work is not sharply divided into experiments which proceed with clock-like precision. Numerous lines of inquiry present themselves, and one of the great values of chemical laboratory work as a training in the methods of pure science lies in the fact that scientific curiosity is usually developed to an unexpected degree.

The graduate student, however, is not selected by the university on the basis of fitness for teaching; furthermore, he is preparing himself for the examinations leading to the award of higher degrees. His mind is primarily centered on his own studies, and his habits are broadly those of a student rather than of a teacher. In many cases he will not prepare beforehand for the laboratory session in which he is to act as teacher. He will certainly not be thinking of the shortcomings of the various students and planning how to correct them. The undergraduate student on his part does not realize the extent of his failure as he goes along. He therefore does not bother the graduate assistant any more than is necessary. Neither of them takes the initiative, and thus it goes until the student has fallen behind in real development to an extent sufficient to attract attention and often to spoil the student's career.

Against this argument might be raised the objection that too much help should not be given. It may be quite possible to destroy the student's powers of observation and initiative by doing the work for him. Just what to do and what not to do is a matter requiring judgment and experience. This is in itself an argument against the graduate assistant.

J. S. LONG

LEHIGH UNIVERSITY

JUNIOR HIGH SCHOOL OFFERINGS

I

DURING the next few years problems of school curricula can best be studied at junior high school levels—ages 12 to 15—during which all children will still be required to attend school. Here differences of abilities, of extra-school conditions and of prospects will acutely manifest themselves, forcing us to differentiate curricula in more ways, probably, than are as yet suspected.

In order to focus discussion on specific problems, it is highly desirable that there be developed some method of exhibiting all practicable offerings of an educational nature for pupils of junior high school age. Some of these may not be under the immediate direction of the school, but will, nevertheless, according to best current educational theory, be counted for credit whenever it can be established that they minister to valuable educational ends.

Again, it is desirable that there be described the several possible "case groups" into which the population of a junior high school can be divided for the purpose of considering optimum educational values. The fact that educators

have never seriously tried to distinguish these groups and are still reluctant to attempt the task, vaguely apprehending that it might in some obscure way prove "undemocratic," should not deter the student from facing the facts as to their existence and importance.

The following analysis is offered as one method of so dissecting certain problems of curricula that discussion can be concentrated upon a series of specific issues:

II

(a) Assume: A large, fully equipped junior high school, 1,500 pupils from all social classes, receiving all retards over 12 years of age, three grades; full-time attendance obligatory to 15 years of age; an industrial city in which large proportions of children enter factories at 15; eight-hour school day, with no home study expected in projective subjects; credit for any extra-school activity where evidence is available that valuable educational ends are served of the kind the school seeks to promote (hence no credit for religious activities) in music, current reading, practical arts, library reading, physical work for body building, foreign language reading, civic projects, etc.; school open Saturday forenoons and in July and August for such units of work (shop, sports, etc.) as are in demand.

(b) All offerings of the school are, for administrative purposes, measured on a "unit" basis, the unit being here arbitrarily designated as a "lotment" (from "allotment," divested of prefix). A "lotment" is the amount of work that can be accomplished, or the ground covered, by learners of modal characteristics (as related to the activity considered) in 60 clock hours. Each of these would, therefore, constitute one "lotment."

(a) One hour daily of combined recitation and study for 12 school weeks.

(b) Two hours of shop work weekly for 30 weeks.

(c) One hour daily given to physical sports for 12 weeks.

(d) One hour weekly to current events for 60 weeks.

(e) Forty-five minutes daily to recitation, and one and one quarter hours outside practice and preparation to a modern language for six school weeks.

In some cases, obviously, a "lotment" measures simply time given; in others it would be based upon achievements experimentally determined to be practicable for pupils of modal powers. "Credit" towards a diploma, promotion or other distinction would, of course, only be given where the activity had for the given learner distinct educational value. Physical work, for a person in need of body-building, would be that; so also would be time given to wholesome recreation, physical or intellectual; similarly for achievement of *new* powers (of proven value) in spelling, history, music and the rest.

(d) Credits must be of at least two classes, projective and developmental—and perhaps of three or more classes—for example, recreational, developmental (in a more limited sense) and projective. These classes can not be interchangeable. For example, every pupil in normal health might be expected to achieve at least three projective "lotments" each quarter. Pupils in poor health might be required to earn one lotment each quarter in outdoor physical activity. Every pupil might be permitted to earn each quarter one lotment for "developmental" home and library cultural reading, proper educational authorities being responsible for approving in the case of any given learner what for him is truly "developmental" reading.

(e) For a given diploma (corresponding to present graduation from three-year junior high schools) there might be required 75 lotments, of which at least 24 must be of the projective order and 24 of the developmental order, whilst as many as 27 of the "recreational order" could be offered.

Obviously, subjects or activities that are recreational for some may be developmental for others—fiction, newspaper reading, participation in sports, outdoor hikes, etc. Also, under some circumstances, activities developmental for the majority may be projective for some—*e.g.*, a foreigner's learning everyday English speech, a cripple's learning to explore the woods, a boy's learning to play a musical instrument so that, besides being an amateur, he can later earn part of his living by it.

III

The following are, clearly, possible courses

for at least some of the pupils in junior high schools:

(1) Pronunciation and enunciation—one or more projective make-up "lotments" (for pupils below normal 6th grade standards) and one or more elective projective lotments.

(2) One to six projective lotments (elective) in oral reading (for amateur cultural excellence, or, perhaps, prevocational to expected teaching, ministry, or leadership vocation).

(3) One to nine projective lotments of public speaking.

(4) One or two lotments of "make-up" oral syntax, and two to six lotments of projective fine syntax (elective, of course).

(5) Two or more projective lotments of friendly letter-writing (as written composition), normally required of all but pupils of already exceptional attainments.

(6) One or two lotments of "make-up" projective penmanship.

(7) One lotment of projective handwriting, prevocational for commercial callings.

(8) One or two lotments of projective "make-up" spelling for deficients.

(9) One to three lotments of projective stenographers' spelling.

(10) One or several lotments of "written composition" (business letters, editorials, stories, descriptions, poetry) for creative literary expression, essentially projective, and always elective.

(11) One or two lotments of written syntax (elective for talented persons).

(12) One or two lotments of "word study" (elective, developmental or projective according to circumstances).

(13) One or more lotments of make-up silent reading for proved deficients.

(14) One or more lotments, projective silent reading for ambitious pupils.

(15) Three, six or nine lotments of Spanish, French, Japanese or other foreign language—open only to those of superior minds with excellent previous school records, and parents convinced that six to ten years of schooling can be given to the language, and who pledge cooperation in furthering extra-school practice.

(16) One to six lotments of arithmetic of general character.

(17) One to six lotments of algebra.

(18) One to six lotments of "composite" mathematics.

(19) One or more lotments, respectively, of "household arts," mechanics, clerical and farmers' arithmetic.

(20) One or more developmental lotments of "appreciational" mathematics (a subject yet to be shaped).

(21) One to six lotments of "general science," developmental.

(22) One to three lotments of simple biology (developmental).

(23) One lotment, respectively, of developmental astronomy, electricity, chemistry, geology.

(24) One lotment of "scientific method" (developmental).

(25) One to three lotments of projective geography (useful knowledge of data and generalizations).

(26) One lotment of "geography finding methods"—map reading, use of sources, etc.—projective.

(27) One to nine lotments of developmental geography.

(28) One or more lotments of economic geography (developmental).

(29) One to three lotments of projective American history.

(30) One to three lotments of projective general history (presumably elective only by superior minds).

(31) Three to six lotments of history (developmental), mostly American but some units (topics, readings), pre-American or world for cultural purposes.

(32) One to three lotments of developmental history (deriving from current social problems) for purposes of civic education.

(33) One to three lotments of developmental social science studies for civic education (as "social problems" or community civics or elementary sociology or problems of democracy).

(34) One to three lotments of projective social science, centering in the exact study of selected problems of economics, sociology, or politics, of proved importance in voting and other civic participation.

(35) One or two lotments of current events treated as a developmental subject.

(36) One or two lotments of current events as serving recreational objectives.

(37) One to six lotments of developmental English literature—including current magazine reading, fiction, drama, etc.

(38) One to six lotments of recreational reading.

(39) One to six lotments of recreational attendance on moving picture drama.

(40) One or two lotments of developmental attendance on moving picture and spoken drama theaters.

(41) One or more developmental lotments of literature for purposes of socialization along

specific lines (humane treatment of animals, regard for "the other half," appreciations of distant peoples).

(42) One or more developmental lotments in heard music.

(43) One or more developmental lotments in amateur performance of music.

(45) One or more lotments of projective performance study of music for culture or as prevocational.

(46) One or more lotments of graphic and plastic art—developmental—for amateur performance.

(47) One or two lotments of plastic and graphic art appreciation through visits, travel, picture study, etc.

(48) One to ten lotments of practical arts for developmental purposes, options to be had from as wide an array as practicable of gardening, cooking, woodworking, photography, typewriting, bookbinding, radio, clothing making, machine assembly, milking, scouting and other projects. Working projects in home economy (wood chopping, bedmaking, animal care, cooking, furnace tending) or for wage-earning in and out-of-school hours (newspaper-selling, grocer's helper, delivery, cake-making, child-tending) can receive credits so long as they are contributive to growth in experience or body strength—beyond which they might receive credit towards recreational or working objectives, but not as projective or developmental offerings.

(49) One to twenty lotments in "body development"—through play, physical work, sports, etc. —all designed to increase powers or qualities of body towards standards of known worth.

(50) One to twenty lotments of physically recreative activities.

(51) One to ten lotments, according to need of projective activities (physical training, etc.) for body-building, either to cure known defects (heart weaknesses, spine curvature, anaemic conditions, injured part) or to prepare for later contingency (sedentary vocation, military service, parturition, etc.).

(52) One to four lotments of systematic instruction in and daily practice of (where needed) hygiene and sanitation of proven value (projective objectives).

(53) One to four lotments of appreciational readings, lectures, etc., for the idealization of health, body vigor, etc., including topics from fields of outdoor recreation, sports, physical work as a means of lasting vigor, sex wholesomeness, etc.

(54) One or two lotments in mental science (developmental).

(55) One lotment in projective "mental training" towards specific goal of "how to study" (some subject), correction of specific bad intellectual habits, attainments of specific new mental habits, etc.

(56) One to four lotments for vocational guidance.

IV

Problems of individual programs.

Assume that pupils attending schools here under discussion have all had good opportunities (according to best of prevailing standards) in elementary schools (first six grades). Assume in the junior high school competent "educational guidance"—aided by records not only of pupils' previous school record, mental age and physical condition, but also of parents' ambitions, parents' financial circumstances, pupil's strong interests, region's opportunities (civic, cultural, health sustaining, vocational and other relevant ascertainable facts. The school retains the final right to prescribe the whole or any part of a program for any pupil when it can do so on the basis of strong probabilities of best ministering to desirable ends.

Problem I: Are there any studies in the foregoing list that should be prescribed for all pupils alike?

The present writer thinks there are none, but

(1) Only pupils of very superior natural abilities in English language studies will be excused from all prescriptions in this field—when they desire it, which will be seldom.

(2) Only pupils coming from excellent home environments and of naturally very promising civic altruism and interests will be exempted from social science studies on the rare occasions when persons of this type will desire it.

Problem II: Under what conditions will deficients in spelling, handwriting, silent reading, oral syntax and utilizer's arithmetic be required to take "make-up" lotments in these subjects?

Only when there is a strong presumption that such prescriptions will be followed by substantial improvements. Some retards certainly can not greatly improve in these fields no matter how much they are coerced.

Problem III: Under what conditions might very marked departures from traditional programs be approved?

Among other cases, for very talented children

certainly. For example, it is found that a certain girl, ready to enter the seventh grade at eleven years of age, has extraordinary musical abilities and tends to be frail physically. She comes from a highly cultured family. Her parents and the girl herself desire an individual program:

(1) As rich as possible in music.
(2) Very full of gardening projects.
(3) A moderate amount of current events.
(4) Rich in developmental literature.
(5) Strong in French.
(6) No mathematics, English language studies, geography, natural science or social studies.

Is there any sound reason, except pedantic tradition, why such a program should not be approved?

DAVID SNEDDEN
TEACHERS COLLEGE,
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EDUCATIONAL EVENTS

ILLINOIS SUPREME COURT DECISIONS ON TWO SCHOOL LAWS

THE Supreme Court of Illinois has handed down decisions of importance and of wide interest in the Middle West on two school laws. One was on the community consolidated school law, in which the court sustained the constitutionality of the new amendments. A second decision was on the community high-school law and here the court set aside all attempted amendments to the law.

In a bulletin issued last week, Superintendent of Public Instruction F. G. Blair gave a summary of the first case, in part as follows:

> The General Assembly in 1919 enacted the first real community consolidated school law in Illinois. It provided in general that any number of districts might through petition and an election be formed into a consolidated community school district and a board elected which would have full and complete control of the school or schools within the district thus created. The board was given power to transport children living at a distance. . . . Under this law over 60 consolidations were formed within the ensuing four years.
>
> In the General Assembly of 1923, the opposition against the provisions of the law had grown and taken definite form in the presence of certain representatives, particularly of the farming groups, who sought to repeal or modify seriously the main provisions of the law. This opposition was successful in securing serious and fundamental amendments to the law. . . . In several counties mandamus proceedings were begun to compel the county superintendents to establish the new districts.
>
> This took the matter into the court, and in two of the most prominent cases the circuit judges held the new amendments unconstitutional. An appeal from these decisions was taken to the Supreme Court and was thoroughly argued on both sides by qualified and competent attorneys. After due consideration the Supreme Court handed down its decision in the October session sustaining the constitutionality of the new amendments. This means that, where petitions for detaching former school districts from a consolidated community district come to a county superintendent, he has discretion in deciding whether to allow these petitions; but if an election is held and a majority vote is cast in favor of the detachment, he has no discretion and must create the new district and call an election to elect a new board. . . The result of this decision in all probability will be the dissolution of practically all the community consolidated districts formed under the provisions of the 1919 law.

The Illinois community high-school law was enacted in 1917. Opponents have sought in each session of the assembly since to amend its provisions. In the session of 1923 friends and opponents got together on a bill which was planned to remedy some of the apparent faults of the existing law. A number of legal tangles took the case into the lower courts and finally it reached the Supreme Court. In the October term this court handed down a decision setting aside all these attempted amendments to the community high school law. The community high school law, therefore, is now the law which was on the statute books January 1, 1923.

PREVOCATIONAL STUDENTS IN THE BOSTON SCHOOLS

THAT the courses in prevocational centers and in the cooperative high schools of Boston are keeping in school for a year or two longer boys who would otherwise drop out is the conclusion of Superintendent Jeremiah E. Burke, in his annual report made public this week. "The graduates of these courses are making remarkably fine records. Foremen, superintendents,

salesmen, manufacturers and in one case a missionary are upon the lists of graduates."

Superintendent Burke refers to the stimulus to prevocational boys furnished by the motivation of their academic work. He writes:

This year's reports indicate that between 80 per cent. and 90 per cent. of the graduates are going on into the high school. Seventy-five per cent. of these have reached the legal age for leaving school. Therefore, it is apparent that it is a desire for further education that is guiding a large number of these boys on into the high school. It is believed that no course holds its pupils more successfully. The percentage going on to high schools is constantly increasing. This is partially due to the fact that the number of our graduates who have not reached the legal age is growing larger, an indication of the fact that the pupils are being promoted more regularly because they are doing better work as a result of greater interest.

Several general high schools offer a cooperative high school course which is open to pupils from any section of the city. Altogether there are about 1,000 boys enrolled in these courses. Through coordinators, cooperation with industry is arranged for boys who have had one and two years in the school shop. Of the one thousand boys enrolled about one fourth of them are so placed. Boys who for economic reasons must go to work and those who are uncertain as to their desires for the future elect these courses as well as those who believe they have decided upon a career. It is a fact, however, that these courses hold in school for one or two years longer many boys who would otherwise drop out, giving them high ideals, and an impetus towards a higher grade of work than they would otherwise have found it possible to enter. . . .

These courses have a great advantage in that they furnish high school education and apprenticeship training together. It is the intention that the receiving of the high school diploma shall represent the close of the apprenticeship period, so that upon graduating the boy becomes a journeyman worker.

THE FACULTY OF TRINITY COLLEGE

AT the meeting of the trustees of Trinity College on December 6, the anonymous statement that has been widely published in the press that the New York Alumni had demanded the resignations on account of their policy of obstruction of Professor Frank Cole Babbitt, professor of Greek; Dr. Arthur Adams, registrar and librarian, and Dr. Horace Cheney Swan, director of physical education and professor of physiology and hygiene, was deplored and the following statement was issued:

WHEREAS, Certain anonymous statements have appeared in the public press reflecting on members of the faculty of Trinity College, the trustees of the college at their regular fall meeting desire to issue the following statement to the alumni and undergraduates:

No petition has been presented to this board. It has been learned that such a petition was suggested by three very recent graduates, acting as individuals and not representing any group or body of alumni. The trustees know of no conditions which would warrant such a petition and desire at this time to express their appreciation of the loyal and efficient service being rendered to Trinity by the entire faculty, and especially to Professors Babbitt, Adams and Swan; their indignation at the unjust attack made upon them, as well as their regrets to Dr. Hubbard, a loyal member of this board, for the unwarranted use of his name in connection with this matter.

President Remsen B. Ogilby, after the meeting, issued the following statement:

It is a source of keen regret to me that the names of three professors of Trinity College have been mentioned in the papers as obstructing the policies of the President. Professors Babbitt, Swan and Adams have been among my trusted counselors. Their service to the college, extending over many years, has been loyal, devoted and efficient.

No action was taken by the board on the resignation of George S. Stevenson as trustee. The trustees present at the meeting were President Ogilby, Sidney G. Fisher, of Philadelphia, Robert Thorne, of New York, the Right Rev. Chauncey B. Brewster, of Hartford, Major Frank L. Wilcox, of Berlin, Edgar F. Waterman, secretary and treasurer, of Hartford, George Dawson Howell, of Pittsburgh, William Gwin Mather, of Cleveland, John Prince Elton, of Waterbury, Dr. William Stimpson Hubbard, of New York, and Shiras Morris, Samuel Ferguson, Newton C. Brainard, I. K. Hamilton and J. H. Kelso Davis, of Hartford.

THE CASE OF MR. GLASSBERG

CHARGING that race prejudice and American Legion propaganda were responsible for the recent refusal of the New York City Board of

Education to reinstate Benjamin Glassberg, dismissed high school teacher, the committee on academic freedom of the American Civil Liberties Union has petitioned Dr. Frank P. Graves, state commissioner of education, to reinstate him. The petition was signed by Professor Clarence R. Skinner, of Tufts College, as chairman, and by nine other members.

Glassberg at the time of his suspension in January, 1919, was a teacher of history in the Commercial High School of Brooklyn. He was suspended for certain alleged utterances in the classroom. Among these were:

The publication of the truth about Bolshevism was prohibited by the State Department.

Red Cross workers returning from Russia have been prohibited by the American Government from telling the truth about affairs there.

A public school teacher is not allowed to tell the truth about those matters.

In November, 1919, Glassberg was dismissed by the board of education after he had been found guilty of making the utterances quoted.

The board of education at its meeting on October 8 refused to review the evidence in the Glassberg case. The Civil Liberties Union committee says:

At that meeting there was an atmosphere of prejudice and propaganda almost hysterical in character. We submit that no case can be considered on its merits in the atmosphere created by the presence of a large number of protesting officers and members of the American Legion, who appeared to be wholly misinformed in regard to Mr. Glassberg's actual views and his alleged offenses. There is evidence that racial and religious prejudice also entered into the attack upon Mr. Glassberg. The personal bias of the principal of the Commercial High School has been evident throughout.

Refusal to reinstate Mr. Glassberg lends color to the charge that educational authorities are inclined to restrict the freedom of opinion of teachers in the interest of reactionary thought and prejudice, against which there is a widespread and profound sentiment, not only in the teaching profession, but among liberal and tolerant people throughout the country.

The signers of the petition besides Professor Skinner are the Reverend John Haynes Holmes, of the Community Church, this city; Professor Vida D. Scudder, of Wellesley College; James H. Dillard, president of the Jeans-Slater Fund for Aid to Negro Schools; Professor Thorstein Veblen, of the New School for Social Research; A. Muste, of Brookwood Labor College; Dr. David Starr Jordan, chancellor emeritus of Stanford University; Paul Blanchard, field secretary of the League for Industrial Democracy; Dr. Henry R. Linville, president of the New York City Teachers' Union, and Norman Thomas, director of the League for Industrial Democracy.

THE NEW YORK CITY BOARD OF EXAMINERS

THE report of President Ryan, of the New York City Board of Education, holding that five members of the board of examiners have been guilty of irregularities in handling examinations for teachers and principals in the public school system, has been attacked in a letter signed by six members of the board of examiners and addressed to the members of the board of education.

Two of the signers are Louis Marks, chairman of the board of examiners, and Joseph K. Van Denburg, both of whom were exonerated in President Ryan's report. Notwithstanding this, they join four of the accused examiners in declaring:

The report as a whole is honeycombed with errors.

Large portions of it are not founded on the evidence.

It deals largely in sweeping statements, the untruth of which is apparent on their face to any one at all conversant with the work of the Board of Examiners.

It recommends that the Board of Examiners do various things that it is doing and that in many cases it has been doing for many years, the implication being that as to certain elementary matters of procedure the Board of Examiners is and has been derelict.

It holds the Board of Examiners responsible for the coaching evil, overlooking the fact that the Board of Examiners has been for years fighting this evil to the limit of its power, while the Board of Education, which alone has the power to crush it out, has not exercised that power.

It charges that to fix the passing mark after the written marks are known, but before the identity of the candidates is revealed, is a grave abuse.

although this practice was inaugurated many years ago and was supported by Dr. Maxwell as being in line with the best civil service practice.

The letter also protests that at the time President Ryan made his report his investigation, on which he bases it, was not complete. It is asserted he had promised to give Examiners Byrnes, Hannig, Hervey and Smith an opportunity to answer charges made against them by Examiner Sheehan, but that he failed to do so.

Mr. Sheehan is the only member of the board who did not sign the letter. He is severely criticized in President Ryan's report.

AWARD OF THE EDUCATIONAL PEACE PRIZE TO DR. JORDAN

DR. AUGUSTUS O. THOMAS, commissioner of education for Maine and president of the World Federation of Educational Associations, announced on December 7 that Dr. David Starr Jordan, chancellor emeritus of Leland Stanford University, is the winner of the prize of $25,000 offered by Raphael Herman, of Washington, D. C., for the best education plan calculated to maintain world peace.

The contest was held under the direction of the World Federation of Educational Associations and thousands of plans were presented. The number finally was reduced to six after the commission on award had spent months of study. Dr. Jordan's plan was accepted at a meeting held at New York about two weeks ago.

The commission on award consists of the following: Henry M. Robinson, president of the First National Bank of Los Angeles, Cal.; Henry Noble McCracken, of Poughkeepsie, N. Y., president of Vassar College; Governor Percival P. Baxter, of Maine; Herbert S. Houston, of New York; Mrs. P. W. Henry, of Scarborough-on-the-Hudson; Olive M. Jones, of New York, then president of the National Education Association; State Librarian Henry E. Dunnack, of Maine; J. W. Crabtree, of Washington, D. C., secretary of the National Education Association; Cora Wilson Stewart, chairman of the Kentucky Illiteracy Commission; George T. Moody, of Bound Brook, N. J.; Carleton E. Ladd, of Buffalo, N. Y.; William Gibbs McAdoo, of Los Angeles, Cal.; Milton A. McRae, of Detroit, Mich.; Alfred Lucking, of Detroit, Mich., and R. A. Millikan, California Institute of Technology.

Dr. Jordan in his plan recommends that "the World Federation make intensive studies of certain matters pertinent to world amity through the continuous operation of appropriate committee on education for peace." Meanwhile "one must admit that any specified procedure can be at best only a step toward the development of enlightened public opinion and cooperation in effecting mutual understanding among peoples."

Indicating "certain lines of hopeful activity within the scope of the World Federation," Dr. Jordan suggests formation of several committees, as follows:

The formation of a general World Committee on Education for Peace, to function in connection with the several educational groups in the different nations, and a second International Committee to cooperate with many already established organizations for peace in all parts of the world.

A committee to investigate the present teaching of history the world over, reporting also on textbooks used, their virtues and their delinquencies from the standpoint of international amity.

A committee on the teaching of patriotism.

A committee to consider special plans of promoting mutual international understanding.

A committee to consider the possibilities of better relations through the international use of athletic sports.

A committee to consider the possibility of a continuous effort to commit the visible influence of the Government of the United States to definite activity in behalf of peace by means of a Bureau of Conciliation in the Department of State, or a Peace Council connected with the same department.

A committee to consider without prejudice the question of military training in school and college, its possible advantages to the individual and the nation, with the alleged accompanying drawbacks and dangers.

A committee to consider "preparedness" in regard to the educational, economic and social aspects.

A committee to consider standing incentives to war and the possibility of their abating through legislation, the influence of public opinion, or otherwise.

A general study through a committee and through individual investigation of the current arguments for war as a cosmic necessity.

A committee to study The Hague Court of Arbitration, also the present Permanent Court of International Justice and the relation of these two activities to world education.

A committee to consider the League of Nations and the problems involved in our acceptance or adhesion to that organization, with special reference to its bearings on international education.

EDUCATIONAL NOTES AND NEWS

C. E. EDDLEBLUTE, former superintendent of schools of Laramie, Wyoming, has been elected president of Clayton College, Denver.

SAM A. BAKER, who had been defeated in his campaign for reelection as state superintendent of education of Missouri, was elected governor on the Republican ticket by a majority of forty thousand votes.

GOVERNOR-ELECT HIRAM BINGHAM, of Connecticut, formerly professor in Yale University, was nominated for United States Senator by the Republican State Convention held at Hartford, Conn., on November 25. The Democrats in session at New Haven, on the same day, nominated Hamilton Holt, formerly editor of the New York *Independent*.

ON the occasion of the completion on October 1 of twenty-five years of service to Teachers College, Columbia University, of Dr. Maurice A. Bigelow, professor of biology at Teachers College and director of the School of Practical Arts, a group of his colleagues met at his office, and Dr. Benjamin R. Andrews, associate professor of household economics, spoke in appreciation of Dr. Bigelow's work for the college.

AT a recent convocation at Whitman College, the members of the Alumni Association who had taken their major work in biology arranged a special program in recognition of the twenty-five years of service to the college of Professor H. S. Brode. The recognition included the the presentation of a gift as well as words of appreciation.

ON December 3, a reception was tendered Dr. George F. Bowerman to celebrate his twenty years' librarianship at the Public Library of the District of Columbia. The reception was attended by about 300 of Dr. Bowerman's personal friends and colleagues, district and government officials and representatives of educational and scientific societies of Washington. In brief tributes, attention was called to Dr. Bowerman's contribution to Washington, to the educational life of the city and to the profession of librarianship.

PRESIDENT CHARLES A. LORY, of the Colorado State Agricultural College, has been elected president of the Colorado Education Association for 1925.

DR. HERBERT W. SMYTH, for 22 years professor of Greek literature, will cease to teach at Harvard University on September 1, 1925. Other resignations are of Alan R. Priest, tutor in the fine arts department, effective December 1 last, and of Richard Ames, secretary of the law school, effective on September 1, 1925.

JAMES C. GRAHAM has been made dean at Ripon College, to succeed W. H. Barber, who has become identified with the University of Wisconsin.

C. C. CERTAIN, formerly with the Detroit Public Schools, has succeeded Austin Cunningham as editor of the Junior Red Cross publications.

AT a meeting of the Massachusetts Child Labor Committee, held in Boston on December 2, the Massachusetts State Commissioner of Education, Dr. Payson Smith, was elected a member of the board of directors. Grafton D. Cushing was reelected president.

RECENT elections to the committee of trustees of the Carnegie Institute of Technology include E. M. Herr, president of the Westinghouse Electric and Manufacturing Company; Frank B. Jewett, vice-president of the Western Electric Company; J. C. Hobbs, of Painesville, Ohio (alumni trustee); Charles M. Schwab and Otto H. Kahn.

DR. GLEN LEVIN SWIGGETT is a delegate to the third Pan–American Scientific Congress, which meets in Lima, Peru, from December 20 to January 7, as representative of the U. S. Bureau of Education, the National Education Association, the American Economic Association, the National Council on Foreign Service Training and the Georgetown University School of Foreign Service.

DR. AMBROSE L. SUHRIE, professor of normal school education in New York University, will give a course of lectures at the Newark Institute of Arts and Sciences on "The philosophy of education."

THE annual convention of the Association of Colleges and Secondary Schools of the Southern States opened at Memphis, Tenn., on December 10. The speakers included Dr. A. B. Dinwiddie, president of Tulane University, and Professor E. A. Bechtel, dean of the College of Arts and Sciences.

A ROUND table conference on foreign service training will be held at the Congress Hotel, Chicago, on December 30, in connection with the annual meeting of the American Economic Association. Dr. E. L. Bogart, of the University of Illinois, a member of the National Council on Foreign Service Training, will preside. The speakers include Robert J. Ray, of Northwestern University; Howard C. Kidd, of the University of Pittsburgh; Rufus S. Tucker, of the United States Bureau of Foreign and Domestic Commerce, and Edmund A. Walsh, regent of the Georgetown University School of Foreign Service.

DR. ERNEST HORN, of Iowa State College, gave lectures on silent reading before grade school teachers of Cleveland on December 4 and 5, under the auspices of the Principals' Club.

DR. ERNEST M. HOPKINS, president of Dartmouth College, delivered recently a lecture on "The relation of a man's college education to his life work" at Harvard University in the series of lectures arranged by the "Committee on the Choice of Vocations."

ARRANGEMENTS for the exercises in memory of Woodrow Wilson to be held in the House of Representatives on December 22 have been completed. The eulogy will be delivered by Dr. Edwin A. Alderman, president of the University of Virginia, who was among the most intimate of the friends of the president. Senator Cummins, president of the Senate, will occupy the speaker's chair. Speaker Gillett will occupy a seat to the left of Mr. Cummins. Senator Swanson, of Virginia, and Representative Bacharach, of New Jersey, the chairman of the Joint Congressional Committee, will escort Dr. Alderman. Music will be by the United States Marine Band. The exercises will begin with a prayer by the Rev. Dr. James Shera Montgomery, chaplain of the House of Representatives, and will conclude with a benediction by the Rev. J. J. Muir, the chaplain of the Senate.

THE one hundred and second birthday of Elizabeth Cary Agassiz, one of the founders and president of Radcliffe College until 1903, was celebrated at the college on December 5. Formal exercises took place at a noon hour meeting before Mrs. Agassiz's picture in the living-room of the Agassiz House, the building named after her, the funds for which were given to her as a surprise, on her eightieth birthday, twenty-two years ago, by the alumnae and friends of the college. President-emeritus LeBaron R. Briggs delivered the principal address.

EVERY public school in Manhattan will eventually receive a memorial costing $100 by the terms of the will of Miss Frances Peters, filed with the surrogate's court recently. The memorials are to be in honor of her sister, Marion Peters. During her life Miss Peters was active in civic work in the city. She was president of the City Gardens Club and vice-president of the League for the Protection of Riverside Drive.

OWEN WESLEY MILLS, professor of biology at Middlebury College since 1918, died in Salem, Mass., on October 4.

DR. CHARLES A. WAGNER, superintendent of the public schools of Chester, Pa., died on November 21, aged sixty-one years.

JAMES CARRUTHERS GREENOUGH, president of Massachusetts Agricultural College from 1883 to 1887 and principal of Westfield Normal School the following ten years, died on December 4 at the age of ninety-five years.

DR. FRED W. HIXSON, president of Allegheny College for four years, died at Meadville, Pa., last week, aged fifty years. He was a graduate of De Pauw University. He served as president of the University of Chattanooga from 1914 to 1920.

DURING the presidency of Dr. Samuel Plantz, who died November 13, Lawrence College grew from an enrollment of two hundred to 1,100 and there was an increase in value of grounds and buildings from $125,000 to more than a million dollars. During these thirty years all debts were paid off and an endowment was built up.

AN anonymous gift of $250,000 has been made by a New York banker toward the five million dollar endowment that is being raised for the Hampton and Tuskegee Industrial Institutes.

THE Carnegie Corporation has made a gift

of $190,000 to Dalhousie University. Of this sum, $90,000 will reduce deficits, while the remainder will be divided into five annual payments of $20,000 against future deficits.

JOHN NICHOLAS BROWN, of Providence, R. I., has given $15,000 to the Oriental Institute of the University of Chicago, the amount to be used specifically for payment of the salary of a new member of the staff which conducts important researches in Egypt.

GROUND will be broken by President A. R. Brubacher, on December 18, for a $1,000,000 addition to the State College for Teachers in Albany. This event will also mark the eightieth birthday of the institution, the oldest and largest teachers' training school in the state.

THE trustees of the Johns Hopkins University plan to develop the present department of education into a Teachers College.

THE annual meeting of the American Association of Teachers of Spanish will be held in Denver on December 22 and 23. The secretary of the Denver chapter having charge of arrangements is L. A. Ward, 1605 Pennsylvania Street, Denver.

MOUNT HOLYOKE COLLEGE last week entertained 30 delegates from women's colleges of the east, south and middle west, at the fourth annual conference of the Intercollegiate Dramatic Association. Delegates were present from Adelphi, Cedar Crest, Cornell, Delaware, Ohio, Elmira, Goucher, Hollins, Hood, Keuka, Mount Holyoke, New Jersey, Russell Sage, Simmons, Skidmore, Vassar, Vermont, Wheaton and Wellesley Colleges.

A BILL providing for the formation of an executive department of education and relief has been introduced by Frederick W. Dallinger, chairman of the House Education Committee. A secretary, appointed by the president, would head the department, aided by three assistants, heading education, public health and veterans' relief agencies which would take over the duties of numerous bureaus now under the jurisdiction of other departments. The bill is reported to be drawn along lines approved by the White House.

THE annual report of the National Kindergarten Association, made public recently, shows that the association has been instrumental during the past year in introducing kindergartens caring for 23,000 children in ten states. The association is cooperating with the societies comprised in the National Council of Women in working for progressive kindergarten laws in 13 states. Field secretaries of the association are giving part-time service in six of the nine states having petition laws.

THE Bureau of Research and Statistics at the University of Denver which is carrying on statistical research in cooperation with the Denver Chamber of Commerce announces the awarding of two fellowships to F. L. Carmichael and Forrest R. Hall, graduates of the commerce school. The fellowships extend until the last of May, 1925. Two additional fellowships will be offered for next year, each paying about $750. They will be open to any graduate students who are especially qualified in statistics, economics and mathematics to aid the bureau in its work. These fellowships were made available through an appropriation by the Denver Chamber of Commerce to go toward a statistical analysis of the business, industrial and social resources of Colorado. The first duties of the winners of these fellowships will be to aid in making this analysis. The Bureau of Research and Statistics at the University of Denver is under the direction of Professor John H. Cover, formerly a member of the faculty of Columbia University.

MAYOR HACKETT, of Albany, N. Y., has made a statement in defense of married women teachers in opposition to the Board of Education, which has ruled that women teachers in the public schools who marry are to be expelled. One teacher, Mrs. Emma McC. Thomas, has been summarily dismissed and she is taking an appeal to Dr. Frank P. Graves, state commissioner of education.

DR. PAYSON SMITH, commissioner of education for Massachusetts, has recommended to the General Court of the state that, if communities are to receive educational state aid as now provided by law, their school teachers should have a minimum of two years' training after a four-year high school course. Commissioner Smith

states that there are more than 2,300 teachers who have had less than two years' training in normal schools or colleges, and recommends that in order that the smaller towns may be enabled to comply with this proposed change they be given an increased contribution for salaries by the state. It is further suggested by Commissioner Smith that the contribution made by the state to union school districts be increased so that the salaries of their superintendents may be raised to $3,500 a year. None now receive more than $2,500.

THE right of the New York Board of Education to transfer principals and teachers from one school to another at will is upheld by State Commissioner of Education Frank P. Graves, who, in a recent decision, dismisses an appeal brought by Miss Katherine R. Callahan, who two years ago was transferred from P. S. 115, Brooklyn, where she had served for nineteen years, to P. S. 197, Brooklyn. Miss Callahan had been in charge of P. S. 115 as "principal of the fourth order," a designation given years ago by a former Board of Education to those in charge of schools which were not large enough to require a licensed principal. When P. S. 115 became so large as to require the assignment of a principal the board transferred Miss Callahan to a smaller building. The case is unique because it is believed to be the first one on record in which a teacher disputed the right of the Board of Education to make a transfer.

THE Cleveland Teachers Beneficial Society is fifteen years old this year, having been organized in 1909. It is a professional organization for mutual help. It has a membership of about 770 and a reserve fund of about $20,000. On the death of a member $500 is paid to his beneficiary. Any teacher under fifty years of age, newly appointed in the Cleveland schools, may become a member by paying an initiation fee of $3 plus the annual fee of fifty cents to cover clerical service. Any teacher over thirty-five must present a satisfactory health certificate. A teacher who has been in the Cleveland service for more than three years must pay the initiation fee plus all assessments levied after the third year of service.

FIGURES on the attendance at Presbyterian colleges gathered by the Presbyterian Board of Christian Education show a gain of 824 students of college grade this year over a year ago. There is a total gain, including special students, of 1,798, with four or five colleges still to be heard from. The students total 17,308 in 51 Presbyterian institutions with 16,342 in the college department. The largest Presbyterian college, according to these figures, is Lafayette, with 961 students. Coe College comes next with 915; Wooster has 858. Carroll College, with a gain of 101, shows the largest increase over a year ago.

Christian Education reports that, of eight of the leading and best equipped theological seminaries of the United States, two pay a minimum salary of $8,000 for the full professorship. The minimum salary for professors on full time ranges from $2,500 to $6,000, the prevailing salary being from $4,000 to $5,000. The associate professors receive from $3,500 to $6,000, the assistant professors from $2,700 to $4,500, and the instructors on full time from $1,500 to $3,500. Some of the salary schedules have not been changed for many years.

OWING to the civil war in China students who receive an allowance from the Boxer Indemnity fund find themselves without money. At the University of Wisconsin a committee was appointed to handle the matter. Requests for aid were sent to several of the large educational foundations. The university loan funds were searched for available money. Fraternities offered to take the Chinese into their lodges during the emergency, and many church and civic organizations offered aid. In the midst of these efforts, word came from the Chinese Educational Mission in Washington that money had been obtained from Shanghai to tide over the 400 Chinese government students in America for a month. It is said that the indemnity fund is safe and the sending of checks will shortly be resumed.

SPECIAL CORRESPONDENCE

A GLIMPSE OF NEW SCHOOLS IN GERMANY

ONE feature common to all the new schools in Germany is their attempt to orient their education to the needs of the time, although they conceive these needs as anywhere in the scale between extreme individualism and state dic-

tatorship. Thus one group believes in the almost unguided blossoming of the child nature; while another trains the individual to subordinate his own will to that of his community. These are the two outstanding tendencies in German schools to-day, whether applied to children or adults, to the poor or the well-to-do.

The place where the ideal of free development is most clearly worked out is in the Hamburg Gemeinschaft Schule; but free development is qualified by a spirit of deep fellowship into which all are drawn. Teachers and parents meet to talk over problems of education, to hear lectures on child training, to plan for the cooperative holiday-home and the extra courses in housework, carpentry and music. Instead of a report bearing the letters A, B, C or D or numbers from 0 to 100, the parents receive occasional notes from the teachers, discussing characteristics which should be encouraged or checked in the home. The pupils enter into the school fellowship in their relations with the teachers and with each other. They are not commanded to learn; they are given a chance to ask questions and to work out their problems together in small groups. This eliminates competition and changes the old hour-planned-routine into a free adventure in knowledge.

The necessary preparation for entering the higher schools is made; but the pupils, in their free-work periods, do much more work than is required. The joy they take in painting, drawing, map-making, story-telling and song-learning keeps them in school after hours, and even makes them beg for school during the short vacation.

The Gemeinschaft Schulen of Hamburg have had a short but stormy history. They began by leaving the children absolutely to their own devices, so that one could see reading, arithmetic, ball-playing and geography all going on at once in the same room. Punishment of the pupils by the teachers was absolutely contrary to the spirit of the venture, and many were the anxious conferences at first over the tendency to take advantage of this fact. Coeducation was another experiment which drew its share of criticism. But the schools have prospered, and the movement has spread. Graduates from the Gemeinschaft Schule have done well in the higher schools. The chief modification seems to be not less freedom but more order. The aim of the schools is to draw out the growing spirit of every child and to direct it into a deep fellowship with nature and mankind.

The Hamburg schools are like our city public schools, filled with the children of workers and the lower middle class. On Mt. Solling, near Holzminden, is a private school where the children of rather well-to-do families live all the year round. Here also the philosophy of fellowship is lived as well as taught. Each teacher gathers around him a "family," boys and girls of all ages; each family has frequent meetings and undertakes experiments of interest to all. The oldest students are divided into interest-groups, according to those who pursue natural science, literature or music in their spare time. The feeling of comradeship throughout the school is fostered by the beautiful evenings in which all come together to listen to music, as well as by the work which each individual does for the group. For half an hour each day every pupil helps to keep the house clean and in repair—training especially valuable for these children of wealthy parents for the philosophy of mutual helpfulness which underlies it. The use of the hands is not neglected in the training of the brain; and work in carpentry, book-binding or gardening teaches the joy of making things and of working together. In fact work together rather than play together is used to teach the team work which Americans seek in athletics. Sport is used for pure recreation, and there are no games with other schools.

In methods of instruction Holzminden places more faith than Hamburg in a well-planned course of instruction. The work is arranged in a weekly alternation of science and the liberal arts, so that interest in either is not hindered by too much diversity. Instruction in religion is given rather as an awakening to ethical and spiritual problems than as information about creeds. Biology is considered the science of life rather than that of animal dissection; and accordingly each pupil observes the plant and animal life on a given plot of ground throughout the year, with advice and guidance from the teacher. The problems of the world

are often unofficially presented to the pupils by teachers, some of whom are pacifists and some radicals. Later the principal hopes to send his oldest class to England or America for a year's study, either as a little German colony or as exchange students.

In the Landerziehungsheim at Schloss Bieberstein the pendulum swings still further from the individual freedom to the subordination of the individual to the state. Bieberstein is a boarding-school for boys from 14 to 18 years old; it is run with Spartan austerity and simplicity. The central educational ideal is that head and heart and hand must all be trained to be of service to the community. The head and heart learn in the class-room and in friendships with teachers and pupils. Each pair of hands is trained to work in carpentry, metal work, book-binding or gardening; and through this service the school is maintained and the teachers paid out of the tuition of the pupils, with no aid from the state or wealthy individuals. The discipline of life is emphasized; the boys are taught that, no matter how distasteful it may be, each must daily give some time and energy to serving the needs of all; as far as possible special arrangements are made for those who wish to give their service in art or music. Rather than the naturally growing garden of Hamburg, one finds here young warriors in a Platonic republic.

Still further removed from the domain of the experimental is the Waldorf Schule in Stuttgart, under the direction of the founder of anthroposophy, Dr. Steiner. In this school the faculty considers that the needs of growing children have been so accurately observed that experiment is no longer necessary; until eight years old children should be allowed to play freely, from eight to fourteen they should be under rigid authority, and from fourteen on they should be encouraged to work out their own success or failure, in self-government and other activities.

The Waldorf Schule is a day-school, and the problems of community life are naturally not so acute as at Holzminden or Bieberstein. Emphasis is laid rather on teaching the children to relive their class-room experience with their whole lives in eurythmic dance. The little ones learn to dance the letters of the alphabet before they can read or write; the older ones interpret stories or history in dancing. The value of their mental experience is deepened by the physical translation. Handwork is also given to the older pupils, who have done some remarkable work in painting and wood-carving. One of the most noteworthy features is the instruction in mathematics, in which pupils are taught to plot the most complicated curves and to turn their appreciation of form and space to practical value in original architectural plans.

Truly, something of the unsettlement of Germany, of the striving for a new world, seems to be reflected in these new schools.

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QUOTATIONS

THE PROPOSED TWENTIETH AMENDMENT[1]

THE congress last spring submitted to the states for ratification a Twentieth Amendment to the Constitution which reads as follows:

Section 1—The Congress shall have power to limit, regulate and prohibit the labor of persons under eighteen years of age.

Section 2—The power of the several States is unimpaired by this article except that the operation of State laws shall be suspended to the extent necessary to give effect to legislation enacted by Congress.

This amendment was passed in the house on April 26, 1924, by a vote of 297 to 69. It was passed in the Senate on June 2 by a vote of 61 to 23. To adopt the amendment thirty-six states must ratify. Thus far three State Legislatures have acted. One state, Arkansas, has ratified. Two states, Georgia and North Carolina, have refused to ratify. There are, therefore, thirty-five ratifications still required. The legislatures of forty states meet in January, 1925. The question of the adoption of the

[1] The publication of an article in SCHOOL AND SOCIETY does not involve editorial endorsement of the opinions expressed. The only editorial policy of the journal is the advancement of education and the relations of education to society by research, information and free discussion.

amendment comes directly before the people of the country in the next few weeks.

The question is whether Congress shall be given the power to "limit, regulate and prohibit the labor of persons under eighteen years of age." Once, in 1916, under the interstate-commerce clause, and again, in 1919, under the taxing power, Congress has attempted child-labor legislation. The Supreme Court declared both laws unconstitutional, and this amendment is an attempt to confer directly upon Congress the power it twice attempted vainly to exercise by indirection. Except as to methods of enforcement, the two Federal acts were the same. They prohibited the employment of a child under fourteen, in any mill, factory, cannery, workshop, manufacturing or mechanical establishment, or of a child under sixteen in any mine or quarry, or in any dangerous, injurious or immoral occupation.

The standards of these federal laws represented a minimum of legal protection against child labor. The Women's Committee for the Children's Amendment says that only thirteen states measure up in all respects to the conservative standards of the first and second Federal child-labor laws:

> Nine states have no law prohibiting all children under fourteen from working in both factories and stores.
>
> Twenty-three states with a fourteen-year minimum age limit have weakened their laws by permitting exemptions under which children not yet fourteen may work.
>
> Fourteen states allow children to go to work without a common-school education.
>
> Nineteen states do not make physical fitness for work a condition of employment.
>
> Eleven states allow children under sixteen to work from nine to eleven hours a day; one state does not regulate in any way daily hours of labor of children.
>
> Four states do not protect children under sixteen from night work.

These are serious evils which urgently call for remedy. The question is whether it is necessary or desirable to turn to Congress and to the Federal Administration for the remedy. *The World*, after careful consideration, has come to the conclusion that it is not necessary and may be highly undesirable.

The reasons which have led to this conclusion are as follows:

1. The progress of the states in the protection of children has been marked since 1912, when the Committee on Standards of Living and Labor of the National Conference of Social Work drew up its model Child Labor Law. In 1912 only twenty-one states prohibited labor in factories and stores of children under fourteen. To-day forty-five states prohibit it. In 1912 only twenty-one states prohibited the labor of children under sixteen in dangerous trades. Nearly all states now prohibit it, and many are above this standard. States limiting the industrial work of children to eight hours a day have doubled in number. There are now thirty-one such states. All but five states now have some prohibition of night work. The educational requirement has been raised in many states. And nearly all have some educational minimum. Ten years ago less than half the states had a physical test to determine whether children might work. All but nine have it to-day. Ten years ago only six states required a physician to pass on a child's fitness to work. To-day twenty-two states require it. This progress is not confined to the north. There has been progress in most states of the south, most striking progress in West Virginia and Alabama.

This advance has coincided with the establishment of Woman Suffrage and with the effective campaign of education waged by social workers. It is proof beyond a doubt that the movement for the protection of children has real vitality in the states and that it is not dependent upon Federal legislation.

2. The protection of children against the evils of child labor is not merely a matter of passing laws to forbid it. A law forbidding a child of a certain age to work has to be enforced. On what does enforcement depend? It depends fundamentally on the parents of the child, the employers of the community, the trades unions and churches and public officials of the locality. In our judgment, based on experience with the Volstead act and other legislation of that character, the government at Washington can not successfully reach into the localities and enforce a legal standard of personal living which the bulk of the people of

that locality do not support. There are a thousand methods of evasion and corruption where public sentiment is not behind a law. As fast as public sentiment is educated the states will raise their own standards and enforce their own laws. The federal government can not, except on paper, raise them any faster.

3. The protection of children is not merely a matter of prohibitory laws and of enforcement of those laws, but of a vast number of other things which are the substitute for child labor. A government which forbids a child to work must at the same time send it to school. A government which deprives a family of the child's earnings must in many cases provide the mother with a pension or the child with a scholarship. The future of child protection requires a great mass of undertakings in regard to education, vocational training and guidance, protection of mothers and the regulation of adult labor. Obviously, these are not proper undertakings for the government at Washington, for they involve a mass of detail and a knowledge of local conditions which are quite beyond the competence of congress or of a federal department. Yet the protection of children is bound up with them, and one of the fundamental objections to the broad powers of the proposed Twentieth Amendment is that it will divert attention from effective progress in the states and center it upon the enactment of paper standards at Washington.

Therefore, since enforcement of laws depends on local support, since the protection of children involves an educational policy and social legislation of a most complicated sort, *The World* is convinced that the short cut of a uniform federal standard will be an apparent short cut, and not a real one.

These reasons are a concrete application of the principle of home rule. That principle is not held by *The World* because it is supposed to be a democratic dogma—a dogma, by the way, more honored in the breach than in the observance—but as a conviction based on observation of the trend of things in this country. *The World* proposes to judge each new proposal on its merits, but in its opinion the burden of the proof is on those who wish to centralize power at Washington. Our last great experience with centralization was the Eighteenth Amendment and the Volstead act. It has been a dangerous and corrupting experience, and *The World* will oppose any further advance like it which involves the regulation from Washington of personal lives and local affairs, except on the proof of overwhelming necessity. In that position *The World* believes itself to be standing for the preservation of a liberal democracy and against the growth of imperialism.

In opposing ratification of the Twentieth Amendment, *The World* recognizes the educative effect upon public opinion of the Federal Child Labor Laws and of the campaign for the amendment itself. They have helped enormously without a doubt to induce the states to improve their own laws. That campaign of education should go on, regardless of the fate of the Twentieth Amendment. Backward states should be made to feel the criticism of a national opinion. Progressive states should be advertised to the nation. Such a campaign of education can in our opinion be promoted best by the following program:

Let Congress pass for the District of Columbia a children's code which can be held up as a model to the States. Such a code will without any of the dangers of centralization establish a national standard.

Let the State Legislatures in refusing to ratify the Twentieth Amendment memorialize the President to call a meeting of the Governors of the forty-eight States to discuss the problem of child protection and to adopt a Minimum Standard Code to be recommended by them to the States.

The World offers the program to the Governor and Legislature of New York.—*The New York World.*

BOOKS AND LITERATURE

Report of the Consultative Committee on Psychological Tests of Educable Capacity and their Possible Use in the Public System of Education. Board of Education, His Majesty's Stationery Office, Imperial House, Kingsway, London, 1924.

THIS report consists of a book of 248 pages and gives a critical account of the status of psychological testing at the present time. It is an attempt to place before British teachers and educators the facts in regard to psychological testing and, furthermore, to indicate how such psychological tests may be used in the various types of schools in Great Britain. Such British

psychologists as Spearman, Myers and Ballard seem to have contributed a great deal. The first chapter on the development of psychological tests is by Burt. Many psychologists from other countries supplied evidence which has been included.

The first chapter by Burt gives a concise but excellent historical introduction to the subject, bringing the matter down to the present day and showing to what extent testing is being carried on in England. It is of interest to note here his report that since 1920 nearly 40,000 civil service candidates have taken psychological tests.

The nature and definition of intelligence is discussed briefly in the report as well as the common assumptions underlying intelligence testing. Interesting, too, is the list of defects which various witnesses before the committee attribute to the Binet scale. Quite impartially both the serious and the trivial defects are listed.

After this general and critical survey of the available tests, there follows a thorough discussion as to how psychological tests may be used in the English educational system. In general, the committee would seem to favor the use of psychological tests, finding the most immediate practical use in group intelligence tests.

At the end of the report, we find thirty-seven conclusions and recommendations. These would seem to summarize the whole report, and they present a very fair estimate of the value and significance of intelligence testing to-day. It is specifically recommended that local education authorities organize courses for the training of teachers in group testing, and that universities should organize professional courses for experienced teachers in the theory of intelligence testing and in the technique of applying and interpreting both individual and group intelligence tests. Of interest to the clinical psychologist is the recommendation that when tests are used for the diagnosis of mental deficiency, the person applying such a test should be an expert (whether a school medical officer or otherwise). In other words, the committee feels that, without special training, the school medical officer is not qualified to diagnose feeblemindedness. The committee also recommends the use of scholastic and vocational tests and believes that the latter can play a part in educational guidance. They comment on the recent attempts in the direction of tests of temperament and character, but believe that at present they are of little practical value to the teacher.

There are several interesting appendices to the report and from them the American psychologist can gain some idea of the extent to which tests are being used in England. On the whole, the report presents an excellent summary of the testing movement at the present time. It shows that England has been slower than this country in the use of these newer tools in education, but it shows also that English educators are now fully aware of their importance and that they are following broadly along the lines of development taken here. They are more conservative in their attitude and by being so, they will undoubtedly avoid some of the excesses committed by the testers in America in the first outbursts of their enthusiasm. The committee's report is a valuable contribution to the literature of psychological testing, and it should be read by every American psychologist interested or engaged in such work.

R. PINTNER

COLUMBIA UNIVERSITY

REPORTS

AT CLARK UNIVERSITY[1]

THE committee will now sum up its opinion with respect to the more general and fundamental criticisms of recent educational policy and administrative methods at Clark University, made by the complainants, by other members and former members of the faculty of the university, and by a large number of its graduates.

The Board of Trustees of the university was confronted in 1920 with an undeniably difficult situation, in which, in the committee's judgment, some further concentration and reorganization of the activities of the graduate school were desirable. The board, however, disregarded several possible plans from which, as it seems to the committee, good results might fairly confidently have been expected; and, without taking counsel with or even making

[1] Conclusion of the report of a committee of the American Association of University Professors.

its program clear to its faculty, it embarked upon an ambitious and difficult educational venture, which might, however, in itself—though not in all the methods employed in it—be justified by success. Thus far it has not been justified by success; the committee is unable to dissent from the published opinion of the numerous body of alumni and former professors already mentioned, that the present position of the university (1923–24), with respect to its postgraduate departments, is inferior to that which it held in 1919–20, and that it has lost much of the character which once constituted its special distinction. This result is due partly to the nature of the new policy and partly to a series of grave administrative errors which have attended its execution; the nature and roots of these errors, this report will have made clear. How much of the outcome is attributable to the former of these causes, how much to the latter, the committee sees no sure means of judging; the two factors can not be isolated. With more judicious management the experiment would doubtless have had a smoother course and a more fortunate issue thus far. But that, even under more favorable auspices, it would have proved advantageous for Clark University to abandon the principle of continuity of development to which it was especially committed, to discard so great a part of its intangible assets, and, with very limited financial resources, to attempt to create, at the expense of existing departments, a wholly new school in a large and costly field of study, the committee believes to be improbable.

In this enterprise the university appears to have been involved through the enthusiasm of a small number of members of a lay board of trustees. The entire episode is perhaps chiefly significant as showing how—under a form of government not peculiar to Clark—the policy of an institution may be abruptly revolutionized by a very few men not of the teaching profession, the faculty, as well as the alumni, being treated as a body having no concern in the matter. The unhappy results which followed in this instance were in part due to the effect of this treatment upon the relations of the trustees, and of the president chosen to carry out their policy, on the one hand, and the educational staff, on the other. The faculties of American universities are not now content to be negligible factors in the determination of educational policies; and that is one, though not the chief, reason why it is inexpedient to regard them as such. Peculiar to Clark, however, was a further feature of its organization especially well adapted to cause difficulties—that whereby a single department head, chiefly engrossed with the work and the interests of his own department, was given control over the fortunes of the other departments, whose representatives were not even authorized to communicate with the board of trustees except through him. That in a small institution an active head of a department should also be president is perhaps a desirable arrangement, and certainly is a plan worth trying—but only upon condition that the faculty participate in his election, that he be regarded simply as *primus inter pares*, and that all matters of policy, appointments, etc., be threshed out by a broadly representative faculty body of which the president is chairman—a body without whose counsel he is not at liberty to take any measures of importance. An institution like Clark University, with a small faculty of high standing, is peculiarly fitted for such cooperative government by the group of scholars composing it, under a leader at least partly of their own choosing; and it is peculiarly unfitted for the system which has hitherto obtained there.

The situation at Clark University has been further complicated by By-Law III, which provides that members of the faculty, collectively as well as individually, may communicate with the Board of Trustees only through the president. If this means merely that the president should know of all such communications and that they should be transmitted through his hands without modification, it is not open to serious objection, but if it means that the faculty have no assured way of laying their views before the trustees under any circumstances except at the president's discretion, or that his statements to the trustees are presumed to represent the judgment of the faculty, the rule is a dangerous one. It is apparently interpreted at Clark University in the latter sense; for in his appended statement President Atwood justifies the adoption of the new policy in 1920 wholly without the faculty's knowledge on the

ground that the then president was consulted and that, "under the plan of organization here at Clark," the president "represented the faculty in all negotiations with the trustees." This seems to the committee an unusual and unconvincing conception of faculty representation; and its practical effect is to keep the trustees more or less in ignorance of the real situation in the university. That such a plan is now breaking down even in industrial and commercial establishments would appear to indicate that it is unsuitable for an organization of professional workers. It is the opinion of the committee that the recent history of Clark University shows that the amendment of this by-law would be in the university's interest.

Of President Atwood it is to be said that, in consenting to become the executant of the new policy, he undertook a difficult and embarrassing task in which, in the nature of the case, criticism and opposition were inevitable. It was a task demanding not only energy and sincere enthusiasm for the science of geography (both of which he has abundantly manifested), but also a high degree of tact, administrative wisdom, coolness and good humor under opposition, fairness in controversy, and ability to see other men's points of view; and these qualities he has apparently been unable to command. One of the gifts most requisite in an administrative officer is the power to foresee the natural reactions of other men to his own programs and measures; President Atwood's lack of this seems to the committee to be most plainly shown in his genuine surprise and anger at the opposition which the new policy, and various specific acts of his own, aroused. The charge that he is indifferent to scientific research as such does not seem to the committee to be established; it was a necessary consequence of the new policy that this impression should be produced in the minds of members of those departments not favored by that policy. On the other hand it is true that his administration has been more distinguished by the addition of a summer school, correspondence courses, an athletic field and a dormitory, than by the condition of the research-activities of the university. The establishment, in an institution having a very small faculty, of a summer school manned chiefly from its own staff, and the requirement of a larger number of undergraduate courses per teacher, are measures unfavorable to productive scientific work in such an institution. Dr. Atwood has, however, introduced a plan of sabbatical leaves which should in the future do something to offset the bad effects of these measures. He has, also, cooperated with the faculty in increasing the requirements for the A.B. and higher degrees. The most serious criticisms to be brought against his administration relate to qualities and tendencies sufficiently indicated elsewhere in this report, which it does not appear needful to attempt to characterize further.

Concerning the future the committee is not called upon to predict; but it thinks it important to add that it does not see in the recent history of this university proof of any intrinsic impossibility of maintaining successfully the type of institution which it represents—*i.e.*, a graduate school not associated with a large undergraduate college and covering only a limited range of studies. As an institution of this type Clark University was at its outset an important and unique educational experiment; but the experiment has been hampered by unfavorable conditions not inherent in its nature. It is true that such institutions must inevitably have certain special difficulties to meet. They are, for example, handicapped by certain unfortunate tendencies of American graduate students—the absence of the custom of migration after graduate work has begun, and the disposition to pursue postgraduate study in the same institution in which the student has taken his first degree. Again, where the staffs of departments are necessarily small, the problem of departmental rejuvenescence and of keeping up with the progress of rapidly changing and expanding sciences may sometimes prove especially difficult. On the other hand, such institutions, if wisely organized and conducted, have great compensatory advantages, both for research and instruction; one of the greatest, in the latter respect, is that they should be less likely to confuse the distinctive problems and methods of collegiate and university work. Where these advantages are effectively utilized, there is no reason to doubt that they will attract graduate students of the best type in considerable numbers and make for a vigorous

esprit de corps and an especially keen enthusiasm for research. Certain fundamental principles which may well guide a university of this type were set forth in the statement of policy adopted by the original Board of Trustees of Clark University:

> The settled policy of the university shall be always to first strengthen departments already established until they are as thorough, as advanced, as special, and as efficient as possible, before proceeding to the establishment of new ones. . . . When new departments are established, those shall always be chosen first which are scientifically most closely related to departments already established, that the body of sciences here represented may be kept vigorous and compact, and that the strength of the university may always rest, not upon the number of subjects nor upon the length and breadth of its curriculum, but upon its thoroughness and its unity. . . . While ability in teaching shall be held of great importance, the leading consideration in all engagements, reappointments and promotions shall be the quality and quantity of successful investigation.

The primary cause of the recent difficulties and present condition of this university lay in the abandonment of these principles.

The committee has carefully explored and to the best of its ability, accurately described the facts of the disturbed situation at Clark University, and has stated regretfully its serious conclusions. In thus performing the duty assigned to it the committee hopes that its report may aid in clarifying public opinion, and that it may in no way retard, but definitely promote, the welfare of the university and the more effectual realization of the ends for which the university exists and to which it has in the past rendered notable service.

Respectfully submitted:

ARTHUR O. LOVEJOY, *Chairman*
(Johns Hopkins University),
JOHN M. BREWER
(Harvard University),
ROBERT K. ROOT
(Princeton University),
HENRY S. WHITE
(Vassar College).[1]

[1] Professor E. A. Ross was originally a member of the committee, but has been prevented by absence abroad from participating in the drafting of the report.

SOCIETIES AND MEETINGS

THE ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS OF THE MIDDLE STATES AND MARYLAND

To indicate officially its broadened scope which includes high schools as well as preparatory schools, the Association of Colleges and Preparatory Schools of the Middle States and Maryland has changed its name to the Association of Colleges and Secondary Schools of the Middle States and Maryland. This action was taken at the thirty-eighth annual convention held November 28 and 29 at Washington, D. C., when the educational institutions of Washington and vicinity were hosts to about 400 school and college men and women who attended the convention and the meetings of allied organizations.

The sessions of the association were held in the National Museum, in charge of President John H. Denbigh, of the Packer Collegiate Institute, and Secretary George William McClelland, of the University of Pennsylvania. Addresses of welcome were given by U. S. Commissioner of Education, John J. Tigert, and President W. M. Lewis, of George Washington University.

At the morning session of November 28, Dr. Wilson Farrand, of Newark Academy, spoke on "What secondary school subjects are really fundamental in preparation for college work," and Director Otis W. Caldwell, of the Lincoln School, spoke on "Wanted: a new spirit in science teaching."

At the afternoon session Dean Herbert Hawkes, of Columbia College, read a paper on "The use of general intelligence tests in college." "The freshman course of study, teachers and general guidance" were discussed by Dean C. Mildred Thompson, of Vassar College, and Dr. P. T. Walden, acting dean of freshmen at Yale.

Speakers at the evening dinner were President Denbigh, Professor E. A. Pace, of the Catholic University of America; Dean J. H. Latané, of Johns Hopkins University, and Professor Burgess Johnson, of Vassar College.

At its business session the association unanimously passed a resolution recognizing "the great importance of the subject of oral expression" and recommending "that colleges which

admit by certificate shall consider seriously the granting of college entrance credit to the amount of one half or one unit to those schools which are able to satisfy committees on admission that the courses in oral expression given in those schools are in content, time and strictness of requirement on a par with other subjects for which credit is now allowed." This resolution was submitted by Chairman W. O. Sypherd, in behalf of the committee on college entrance credit for public speaking.

Officers of the association for 1924–25 were elected as follows: *President,* President Frederick C. Ferry, of Hamilton College; *vice-presidents,* Chancellor Samuel P. Capen, of the University of Buffalo; Professor Radcliffe Heermance, of Princeton University; James N. Rule, of the Pennsylvania State Department of Education; Charles W. Bush, of the Wilmington Friends School, and President W. M. Lewis, of George Washington University; *secretary,* Professor George Wm. McClelland, of the University of Pennsylvania; *treasurer,* Principal Stanley R. Yarnall, of Germantown Friends' School.

On November 29 meetings were held of the College Conference on English in the Central Atlantic States, the Association of Modern Language Teachers of the Middle States and Maryland, the Classical Association of the Atlantic States (in conjunction with the Washington Classical Club, the Science Section of the association; the Association of Teachers of Mathematics in the Middle States and Maryland, and the Association of History Teachers of the Middle States and Maryland).

THE VIRGINIA EDUCATIONAL CONFERENCE

WELL over 4,000 teachers, school teachers and citizens from all parts of Virginia attended the annual Virginia Educational Conference, held in Richmond, November 25 to 28. The units represented were the Department of Public Instruction, the Virginia State Teachers Association, the Superintendents Association, the Trustees Association, the Cooperative Education Association and the Virginia Parent-Teachers Association. The attendance and the interest gave evidence of the importance of this yearly conference as an agency for the promotion of education in Virginia.

At the general meeting of the State Teachers Association in the auditorium of the John Marshall High School on November 27, addresses were delivered by Dr. Ambrose H. Suhrie, of the School of Education, New York University; Miss Olive M. Jones, New York City, former president of the National Education Association, and Dr. Edwin Mimms, of Vanderbilt University. Speakers at sectional meetings of the association included Miss Emma B. Grant, of Teachers College, Columbia University; Professor W. N. Hamlet, of the State Teachers College, Fredericksburg, Va.; G. Glenwood Clark, of the College of William and Mary; C. K. Holsinger, of the University of Virginia, and Professor W. E. Gilbert, of the State Teachers College, East Radford, Va.

At the session of the Department of Colleges and Secondary Schools on November 28, State Supervisor of Secondary Education M. L. Combs outlined "The new state high school course of study," and Dr. W. R. Smithey, professor of secondary education in the University of Virginia, spoke on "Articulating the secondary school and college."

"Improving teachers in service" was the subject of an address before the Superintendents' Association on November 26 by H. C. Krebs, professor of education in the College of William and Mary. Superintendent A. H. Hill, of the Richmond public schools, and Superintendent James Hurst, of the Norfolk County Schools, discussed "Selecting teachers."

The long lists of speakers at various sessions included, besides those named, Dr. Thomas E. Finegan, former superintendent of public instruction of Pennsylvania; Professor Edward Capps, of Princeton University; President J. D. Eggleston, of Hampden-Sidney College; Angelo Patri, of New York City, and Dr. Albert Sidney Rowland, of the Pennsylvania State Department of Education.

The organizations holding meetings at the Richmond conference included the English Teachers Section, the Physical Education Section, the Department of School Principals, the Virginia Rural Supervisors Club, the Superintendents Association, the Trustees Association, the Cooperative Education Association, the Virginia Geographic Society, the Modern Language Teachers Section, the Science Teachers Section, the Virginia Society of History Teach-

ers, the Writing Teachers Section, the Department of Colleges and Secondary Schools, the Department of Grammar Grade Teachers, the Virginia Home Economics Section, the Parent-Teacher Association, the Department of Rural Teachers and the Virginia Classical Association.

THE SIXTEENTH INTERFRATERNITY CONFERENCE

A TOTAL of 306 delegates, alternates, undergraduates and visitors, representing 58 fraternities and as many colleges and universities in all parts of the country, attended the sessions of the annual Interfraternity Conference, held in New York City on November 28 and 29.

In his opening address, Chairman A. Bruce Bielaski declared that the Interfraternity Conference, during the 16 years of its existence, "has accomplished at least two important objects which have clarified the position of college fraternities in the national life."

> The first is that fraternities, while properly competitive, are actually enlisted in a common cause and that every fraternity is entitled to, and in fact now has, the confidence and respect of all other fraternities. Secondly, fraternities and college authorities have come to recognize that they are not natural enemies, but that it is the duty of the fraternity on the one hand to serve and assist the college in every way within its power, and to recognize that it must subordinate itself to the college and conduct itself in harmony with the college authorities; on the other hand, administrative officers of our colleges have come to have great confidence in the national organizations of the fraternities. They realize not only the possibility of good which can be had for the college through the proper use of the fraternity system, but the positive duty of recognizing it as a helpful factor in the life of the college and, consequently, of giving to the fraternities recognition and encouragement.

As secretary of the Interfraternity Conference, Henry R. Johnston sketched briefly the work of the past year. He reported the formulation of a comprehensive statement of desirable objectives made at the first meeting of the executive committee, which included: 1. The publication of an authoritative statement of the ideals of American college fraternities; 2. A special study of the situation as to expansion, including a survey of the whole list of institutions concerned, giving the increase of attendance at each in recent years; increase in the number of fraternity chapters; proportion of men students over members of the fraternities; the number of local fraternities, and other like factors.

The report told of aid rendered fraternity groups in South Carolina, of the stimulation and improvement of chapter house plans and architecture, of the study made by the committee on fraternity ideals, of the activities of the committee on expansion and of the development of the program arranged for the conference of undergraduate councils.

The committee on plan and scope reported:

> In our opinion, the conference should confine itself strictly to matters pertaining to fraternities. We feel that in dealing with the various matters outside of our province, even though collateral thereto, we are weakening our position. It should be affirmatively stated that the objective of fraternities is not material, but altruistic, idealistic and spiritual. We are seeking not only the comfort of the undergraduate at college, but the promotion of such spiritual influences, such ideals and such scholarship as will produce character and fitness that will make the fraternity member the highest type of college student.

During a discussion on the comparative increase in fraternity membership and attendance at colleges, Dr. John Martin Thomas, president of the Pennsylvania State College, said:

> The time may come when Harvard and Columbia and all the distinguished colleges of the northeastern section of America will play as small a relative part in the collegiate education of the nation as the historic academies of the same section now play in secondary education. America has no more useful institutions than Exeter and Andover, but private academies do only a small fraction of the secondary education of the country. There are now 15,000 free public high schools in America. A hundred years ago there were no public schools of secondary grade; now we are building one a day, and many of them exceed in cost the entire plant of some colleges. . . .
>
> The fraternity world can not afford to be indifferent to the expansion of public higher education. No fraternity claiming to be national can keep the geographical center of its chapters east of the Alleghenies or ignore the state colleges and universities. If it adopts such a provincial and prejudiced policy, it will find in a few years that it is outside the main stream of the educational life of the nation.

EDUCATIONAL RESEARCH AND STATISTICS

IS THERE A SEQUENCE IN SECONDARY SCHOOL SCIENCE?

THE growth of science in the secondary school to-day is a matter of much discussion by educators. The scientific discoveries of the present age have made themselves felt so generally in the lives of the everyday citizens that school administrators have been forced to recognize the claims of science in our public secondary schools. The rational attempts of the everyday citizen to know more about himself and his environment has caused the supervisor and administrator to recognize values not dreamed of before the days of modern psychology. The work of the Committee on Reorganization of Science and the numerous findings of associations of science teachers have all added cogent reasons why science should have a larger place in the high school curriculum. We may ask ourselves as scientists and teachers of science if these external factors are influencing science teaching, and just to what extent it is affected?

About 16 years ago the writer sent out a questionnaire to 500 leading public high schools in various parts of the United States, asking certain questions germane to the sequence of science in the high schools of the United States. Replies were received from 276 schools, representing 34 different states. The findings of the questionnaire appeared in an article entitled, "The methods, content and purpose of biologic science in the secondary schools of the United States," and was published in *School Science and Mathematics*, Vol. 10, 1910. Last fall the writer sent a second questionnaire to, so far as possible, the same schools that answered the first and to about 500 additional schools. These represented the best public high schools in large cities, small urban communities and, in a few cases, township or district high schools. To date 357 replies have been received. It is the purpose of this article to contrast in a brief way certain statistical information gathered from the two questionnaires and to draw such conclusions as appear tenable from the information thus obtained. In the material which follows the junior high school figures have been omitted for the sake of comparison. Growth of science in the junior high school is, however, very great, and interesting figures will be given in a later paper that show the position "general" or "elementary science" is making for itself in the 7th or 8th grades, or junior high school.

The following tables represent graphically the tabulated answers to the question: What is the sequence of science courses in your school?[1]

A comparison of the two tables shows first that there seems to have been a gradual but healthy increase in the total number of science courses given in the four-year secondary school. In 1908, 276 schools reported 9 courses in general science, 166 in physiography, 623 in biological courses, of which 73 were biology and 193 human physiology, 253 in chemistry, 268 in physics, 45 scattering courses, including astronomy, geology and sanitation. In 1923, 357 schools in the four-year high school showed 239 general science courses, 135 physiographic, 630 biological, of which 299 were biology and 158 human physiology, 398 chemistry and 400 physics, with only 9 scattering courses.

Schools reporting	9th year courses	10th year courses	11th year courses	12th year courses	Total courses
In 1908 276	360	319	334	360	1373
In 1923 357	443	493	480	486	1902

Which shows a proportionate increase of 90 science courses in 1923.

One significant fact does not show on the chart. The courses given are on the whole much better standardized, the number of laboratory periods, the number of hours per week and the number of weeks per school year appear to be much greater for science on the whole than in 1908. Furthermore, there has been a decrease in the scattering "book" courses and an increase in the laboratory sciences. In the above figures, agriculture has not been included. There is a very great increase in the number of courses in agricultural science, but since such courses have been artificially forced into high school curricula through the Smith-Hughes Act, the writer has felt that such growth was artificial and has not included them in the tables given above.

Reducing the figures to a percentage basis, the following tabular comparison is of interest:

[1] Division of states was made arbitrarily according to the grouping suggested by T. Q. Browne in a paper which appeared in *School Science and Mathematics* in 1908. This grouping of states, although arbitrary, represents fairly well certain areas of somewhat like conditions.

SCIENCE COURSES GIVEN IN HIGH SCHOOLS, 1908

	NUMBER OF SCHOOLS	Ninth Grade					Tenth Grade					Eleventh Grade					Twelfth Grade						
		Botany	Biology	Human Physiology, Hygiene	Introductory Science	Physical Geography	Zoology	Physics, Chem., Astr., Geol.	Botany	Biology	Human Physiology	Chemistry	Physical Geography	Physics	Zoology	Botany	Biology	Human Physiology	Chemistry	Physics	Zoology	Astronomy, Geology	Botany	Biology	Human Physiology	Chemistry	Physics	Zoology	Astronomy	Geology
Maine	1																											
New Hampshire	31	1	3	10	3	1	1	1	1	1	5	1	3	13	2	1	4	12	17	1	4	1		1	5	1	1		
Massachusetts	14	1	3	3	1	4	1	7	1	4	9		1	3	10	1	1	3	1	1	1	1		1	1	1	1		
Vermont	1																												
Rhode Island	3	1		1	1	1		1						1	1														
Connecticut	4			1																									
New Eng. States, Total	53	3	6	15	4	6	2	9	2	5	14	1	4	16	3	2	5	15	18	2	5	2		2	6	2	2		
New York	52	20	28	11	5	11	1	10	16	16	16	3	6	18	17	6	8	13	17	3	7	1		1	6	2	2		
New Jersey	39	6	1	4	2	4			1	4	3		1	3	6	1	1	3	3	1	2	1		1	3	1	1		
Pennsylvania	11	2	1	1	1	1			1	1	1		1	1	2		1	1	1		1			1	1				
Delaware	25	7	7	4	1	5	1	1	3	1	2		1	1	1	1	1	2	2		1			1	1				
Maryland	1																												
Dist. of Columbia	3					3																							
Middle States, Total	82	18	30	47	2	16	6	1	16	4	9	4	13	16	1	1	1	1	1	1	1	1		1	1	1	1		
Virginia	3	1				1	1	1	1				1		1														
Georgia	1	1																											
Kentucky	6								3																				
Tennessee	2			4	1	1	1			1			1		1														
Louisiana	1			1																									
Oklahoma	1	1																											
Southern States, Total	14	3	1	5	1	2	2	1	5	1	1	1	1	5	1	1	1	1	1	1	1	1		1	1	1	1		
Ohio	23	8	1	8	1	6	1		10	5	3	1	8	7	1	1	1	1	1	1	1	1		1	1	1	1		
Indiana	13	6		3		1			5	1	1		1	2															
Illinois	26			7	1				13	6	1		3	4															
Michigan	13	2		1		1			6	4	1		1	1															
Wisconsin	10	4				1			6	1	1		1	1															
Minnesota	4	1							1																				
Iowa	8	5							1																				
Missouri	4	1				1			1																				
N. Cent. States, Total	107	34	2	29	2	46	13		42	18	7	1	13	15	2	1	1	2	2	1	1	1		1	1	1	1		
North Dakota	2					2																							
Nebraska	1				1			1																					
Colorado	2					2																							
Utah	1																												
Kansas	4					3			3																				
Rocky Mt. States, Total	11	1		3	1	9			6	1	1		1	1															
California	6		1																										
Washington	1																												
Pacific States, Total	8		1																										
GRAND TOTAL	276	76	36	105	9	94	27	13	94	23	8	2	34	49	5	2	3	4	4	3	3	2		29	7	21	94	6	24	8	1	1

SCIENCE COURSES GIVEN IN FOUR-YEAR HIGH SCHOOLS, 1923

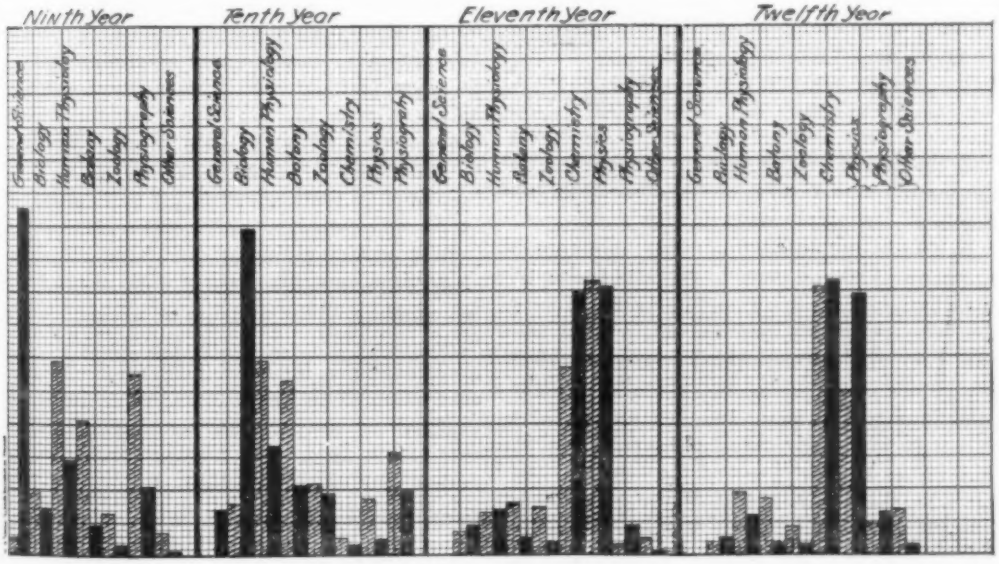
	Number of Schools	Ninth Grade								Tenth Grade								Eleventh Grade								Twelfth Grade							
		General Science	Biology	Botany	Zoology	Physiography	Physics	Chemistry	Other sciences	General Science	Biology	Botany	Zoology	Physiography	Physics	Chemistry	Other sciences	General Science	Biology	Botany	Zoology	Physiography	Physics	Chemistry	Other sciences	General Science	Biology	Botany	Zoology	Physiography	Physics	Chemistry	Other sciences
Connecticut	10	9	4								10	1					1															
Maine	4	4									1	1																				
Massachusetts	27	15		1	1		2			1	9	4	3						1													
New Hampshire	5		1	1	1						2	1	1						1													
Rhode Island	6	6	2				2				1	1	1		1				1													
Vermont	1																															
New Eng. States, Total	53	35	7	2	2		4			1	23	6	4		1	1			1													
Delaware	1	1	1								1	1																				
Dist. of Columbia	1	1									1																					
Maryland	2	1	1								1	1																				
New Jersey	20	17	3								17	1	3						1													
New York	51	45	4		2	1	6			3	9	3	1		13	2		1	1													
Pennsylvania	19	17	3	1	1	1	2				15	4	2		1	1			1													
Middle States, Total	94	38	52	5	3	2	10			3	44	7	6		15	3		1	3													
Alabama	2	2								1	1																					
Georgia																																
Kentucky	2	1								1		1																				
Louisiana	1	1									1																					
Mississippi	1			1			1				1																					
North Carolina	7	5	3								1	1	1		1																	
Oklahoma	2	1			1		1				1																					
Tennessee	2	2																														
Texas	9	5		1	1		5				5	1	1		2																	
Virginia	5	5		1	1		5				4	1	1		1																	
Southern States, Total	31	22	3	2	1		8			3	19	3	2		3																	
Illinois	31	24	4	1	2		10				20	11	8		3	2																
Indiana	32	4	1	2			16				5	1	1		2																	
Iowa	8	6	1		1		1				6	1	1		1																	
Michigan	11	7	1	3	1		2				7	1	1		1																	
Minnesota	6	6					2				6	1	1		1																	
Missouri	5	5		2			3				4	1	1		1																	
Ohio	44	37	6	3	2		3		1		27	1	2		2																	
Wisconsin	10	8	2		1		1				4	1	1		1																	
North Cen. States, Total	129	97	11	10	6		34		1		78	29	19		16																	
Arizona	2	2									2																					
Arkansas	3	2					1				3	1			1																	
Colorado	1	1																														
Idaho	1										1																					
Kansas	1	1																														
Montana	3						2				2	1	1		1																	
Nebraska	6	6									4																					
North Dakota	1	1									3																					
South Dakota	3	3																														
Wyoming	1						2		1		1																					
Utah																																
R'k'y Moun. States, Total	21	17					3				15	9	3		4																	
California	18	13	1				1			1	15	4	2		1																	
Oregon	3	3									3																					
Washington	8	8									5	5	4																			
Pacific States, Total	29	24	1				1			1	23	9	6		5																	
GRAND TOTAL	357	253	70	19	7	60				8	269	67	43	37	6	11	41	16	12	9	33	191	396	20	2	16	9	7	28	204	39	7

	9th year		10th year		11th year		12th year	
	1908	1923	1908	1923	1908	1923	1908	1923
General science	2.5	53.10		1.93				
Biology	10.	16.09	7.25	48.13	2.09	3.47	1.95	2.67
Botany	21.1	4.37	29.98	16.22	7.79	2.5	8.05	1.85
Zoology	7.5	1.60	26.5	10.41	7.19	1.87	4.17	1.44
Human physiology	29.17	14.72	10.72	8.95	6.29	6.88	9.01	5.97
Chemistry			2.52	1.45	28.14	39.64	40.55	41.31
Physics		.43	7.88	2.66	41.31	40.91	25.	39.30
Physiography	26.11	10.11	15.46	9.92	1.81	4.18	4.72	6.17
Other sciences	3.61	.43			2.39	.41	6.38	1.44

These figures show that courses in general science, biology, chemistry and physics have increased in the four-year secondary school, while those in physiography, botany, zoology, human physiology and the scattering courses in science have decreased.

We may write into these figures other facts gleaned from parts of the questionnaire not here quoted. One reason for the smaller number of courses in botany, zoology and human physiology comes from the absorption of much of this material by courses in general science or biology. Chemistry and physics have both relatively increased in number. The scattering offerings, many of them "book" courses, have greatly decreased.

This article has attempted to determine whether there is a sequence of science in the secondary schools of the United States. In 1908, there seemed to be no very definite sequence, although the biological sciences predominated in the ninth and tenth years, while the physical and chemical sciences were found in the eleventh and twelfth years. General science as such was practically unknown in 1908. If we glance at the accompanying graph, we will see that very different conditions exist to-day. General science has found a place for itself in the ninth grade (first year of the four-year high school). For the high schools reporting in 1923, 53.10 per cent. of all ninth grade science courses are general science. In the same way, biology as a unified science has an established position in the tenth year. As we will see by a glance at the tables, a few states, notably New York, stand out distinct from this sequence. In New York,



COMPARISON OF SCIENCE SUBJECTS IN FOUR-YEAR HIGH SCHOOL, 1908–1923. CROSSPATCHING, 1908; SOLID, 1923.

the change from the normal sequence is brought about by the imposition of the so-called Regents examinations given by the University of the State of New York. A careful study of the answers to the questionnaire from New York indicate a rather hearty dissatisfaction on the part of many teachers in regard to the sequence established there. In the eleventh and twelfth years, physics and chemistry are well established, having improved the position that they held in 1908.

There is a tendency in some parts of the United States, notably in the eastern middle states, to place physics in the eleventh year and chemistry in the twelfth year. In the far west chemistry appears to have more holdings in the eleventh year and physics in the twelfth, while in the middle west and southern, the courses are almost equal in number, with a slight preponderance of chemistry in the eleventh and physics in the twelfth. The change indicated, which throws chemistry in the last year in the high school, is perhaps due to two factors: (1) A change of heart on the part of the college entrance authorities in the east toward chemistry as an entrance subject, and (2) the electron concept of matter which makes chemistry teaching easier after the teaching of physics.

A study of the tables indicates other rather interesting facts. (1) Physiography, once a leading first-year subject, has decreased rapidly in the number of courses given and is tending to appear as an advanced course in the twelfth year. (2) As has been pointed out, botany and zoology, as such, have almost disappeared from the ninth year and only appear to about one half the extent of that of fifteen years ago in the tenth year. Biology, on the other hand, has increased proportionately in the ninth year from 10 per cent. to 16.09 per cent., in the tenth year from 7.25 per cent. to 48.13 per cent. of all science courses given in that year. (3) As has been previously pointed out, general science has practically appeared as a new subject since 1908, in the junior high school and in the ninth and tenth years. (4) The study of the figures show slightly varying sequences of science in the different parts of the country. The far west, California leading, New Jersey, Pennsylvania, New York, Ohio, Michigan, Wisconsin, Minnesota, Iowa and, to a lesser extent, Illinois, all seem to have adopted more or less definite sequence of science. In the New England states there appears to be more division of opinion and apparently more diversification in courses than in other parts of the country, the sequence thus being lost because of greater possibilities in election. In the great corn and wheat belt, as we would expect, botanical courses take place to some extent of the biological courses as such in the tenth year. The southern states appear to be much more active pedagogically than they were 15 years ago, and a study of the context of their questionnaire answers shows a decided advance in the number of hours devoted to science subjects as well as the number of courses given.

The somewhat lengthy questionnaire can not be discussed further here, except to say that answers indicate a very much greater number of students taking science courses now than 15 years ago. Much of this increase appears to come in the ninth or tenth grades of the high school, where there are very many required courses in general science or biology. Chemistry appears to have gained in numbers. Physics seems to be losing in some schools and gaining in others, while botany and zoology and physiography have distinctly lost in number of students taking them.

In response to the question: "Do chemistry and physics gain anything from the earlier science courses?" there was a very decided answer in the affirmative—78.2 per cent. of those answering said "yes," 10 per cent. were uncertain and 11.8 per cent. gave a negative reply. In response to the question: "Are the science courses more closely related to each other and to other courses in the secondary school than they were 15 years ago?" 71 per cent. answered in the affirmative.

It is evident, therefore, from even a cursory study of these figures, that definite changes are taking place in the sequence of science courses in the secondary school and that these changes are resulting in better teaching, a more definite correlation of science and a greater degree of emphasis on teaching than was shown by data obtained in 1908. The findings show that the outlook for science teaching in the secondary schools appears bright for the future.

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